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IN THIS ISSUE

itical Appraisal
Centric Relation 342

lified Technique for Re-
val of Impacted Lower
ird Molar 346

ted Bicuspids and
ial Gradients 348

es Zoster 349

sion of Ranula 352

ma Globulin 353

ival Pits for Better
nalgams 354

Hemangioma Treated with
ve Per Cent Sodium
orrhuate 355

Editor's Page 357

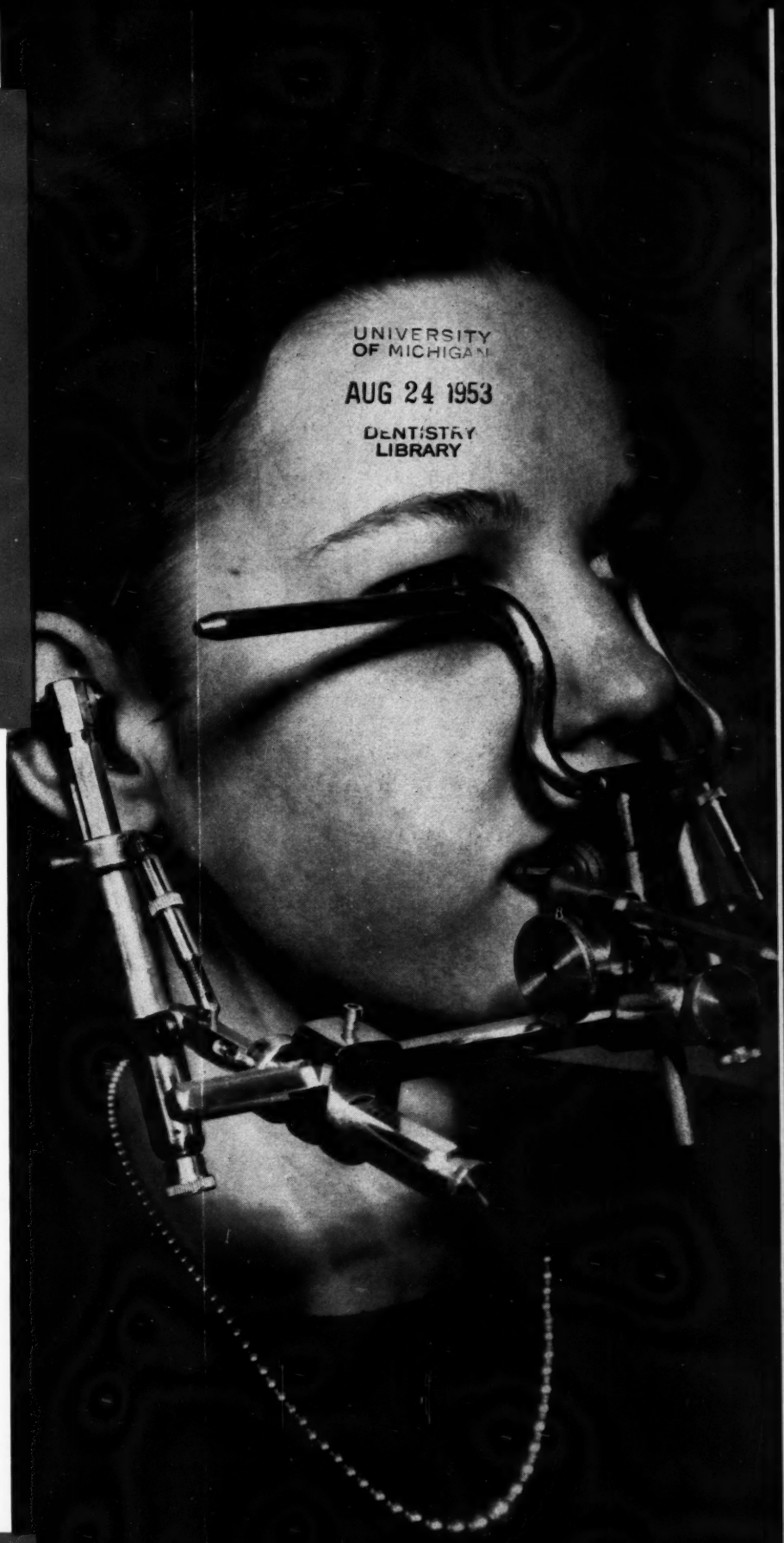
ical and Laboratory
ggestions 358

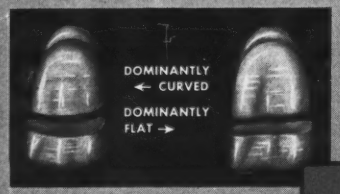
icine and the Biologic
iences 361

ra-Angles 368

Complete Table of Contents appears on page 341)

Cover illustration—Page article, page 342





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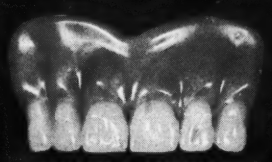

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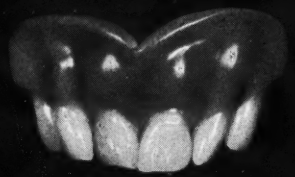

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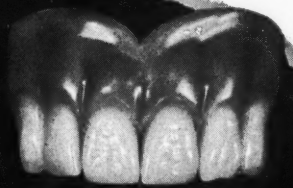

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Vol. 59, No. 8

Dental Digest

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AUGUST 1953

A Critical Appraisal of Centric Relation
Harry L. Page 342

Simplified Technique for Removal of Impacted Lower Third Molar
Major M. H. Shaner, USAF (DC) 346

Hypotensive Anesthesia in Dentistry (An Abstract)
J. C. Middleton Shaw, D.Sc., M.A., B. Dent. Sc., D.D.S., F.R.S., F.D.S.R.C.S., and A. E. Dodds, B.Sc., D. Ed., B.D.S. 347

Rotated Bicuspids and Axial Gradients
W. Amos Moore, D.D.S. 348

Herpes Zoster
Martin S. Protzel, D.D.S. 349

Excision of Ranula
Daniel J. Holland, D.M.D. 352

Gamma Globulin (An Abstract) 353

Gingival Pits for Better Amalgams
Meyer M. Silverman, D.D.S. 354

Lip Hemangioma Treated with Five Per Cent Sodium Morrhuate
Joseph C. Tam, D.D.S., M.S.D. 355

Ethyl Chloride Spray in the Treatment of Fibrositis, Myositis and Allied Conditions (An Abstract)
M. M. Kinawi, M.Ch., F.R.C.S. 356

The Editor's Page 357

Contra-Angles 368

Clinical and Laboratory Suggestions 358
1. An Impression Aid. 2. A Matrix for Gingival Cavities. 3. Copper Band Adaptation. 4. More Accurate Full Impressions. 5. A Holder for Endodontic Instruments. 6. An Aid in Anesthesia.

Dental Caries in Rats Fed a Diet Containing Processed Cereal Foods and a Low Content of Refined Sugar (An Abstract) 360

Medicine and the Biologic Sciences 361

pH of Saliva and Tooth Decay (An Abstract) 366

Tonsillectomy and Poliomyelitis (An Abstract) 367

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A Critical Appraisal

of CENTRIC RELATION

HARRY L. PAGE, Valparaiso, Indiana

DIGEST

The author of this article believes that it is probably because centric relation has different connotations for various members of the dental profession that the concept is fraught with ambiguity and the results of its use are disappointing. This article presents a spirited and straightforward discussion of both the positive and negative sides of the question finally suggesting that the concept of centric relation be replaced by a new and different concept which is mechanically and physiologically sound.

Subject of Controversy

If current dental conversation, formal discussion, literature, and clinical data may be used as criteria, centric relation is attended by so much confusion as to stultify dentistry's insistence that this relation is vital to successful articulation.

Conceptual Clarity Absent—How a concept so vaguely understood can be given such emphatic and general endorsement is a puzzle. After more than a century of close study, clinical observation, and daily practice, restricted to a part of the body no bigger than a pair of clenched fists, conceptual clarity among dental teachers, at least, would seem to be overdue on a belief rated so important.

Meaning of Term in Practice—To practising dentists, centric relation means simple apposition of the maxilla and the mandible in the horizontal plane only. When two bite-blocks or a wax bite in the patient's mouth appear to be in satisfactory relationship from left to right and from front to back, the apposition of the blocks alone is accepted as centric relation. This is admitted tacitly by the methods used in daily practice in the majority of dental offices. If the standard of comparison is that of the over-all results of orthodox methods, these procedures are exempt from criticism.

Objections to Practical Implications—Critics who object to standard techniques and insist that they offer a superior type of science are actually doing nothing of the kind; they are only tinkering with more gadgets. Their claim to superiority is nullified in granting vertical dimension an importance equal to centric relation itself.

Tenet has no Clinical Distinction—Demurrers hold it to be (and it is) disastrous to change vertical dimension outside the head once centric relation is obtained. From the simplest to the most esoteric dental philosophy this tenet is common to all. This waives all claim to superiority.

Modes of Terminology Confused

Confusion concerning the subject of centric relation applies even to the terms used. According to Posselt,[1]

"A great number of terms have been used about the arrow point relation, such as, for examples:

"Centric occlusion (1), centric position (2), centric relation (3), dorsal position (Dorsalstellung) (4), gothic arch centric relation (5), habitual rest occlusion (habitueller Ruhebiss) (6), retruded centric relation (7), retruded rest position (8), terminal occlusion (Schlussbiss) (9), terminal occlusal position (Schlussbissstellung) (10), true centric relation (11), unstrained centric relation (12)."

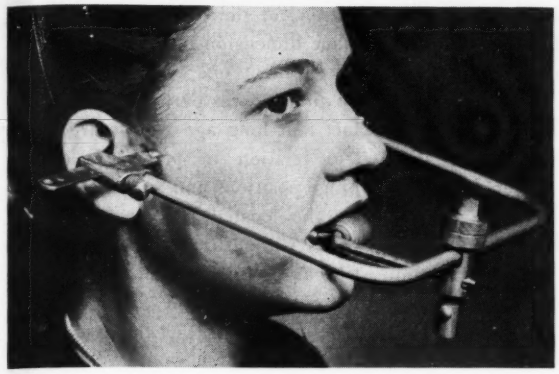
Terms Referring to Mandible Anterior of the Arrow Point—"The following terms among others have been used about a position of the mandible anterior of the arrow point:

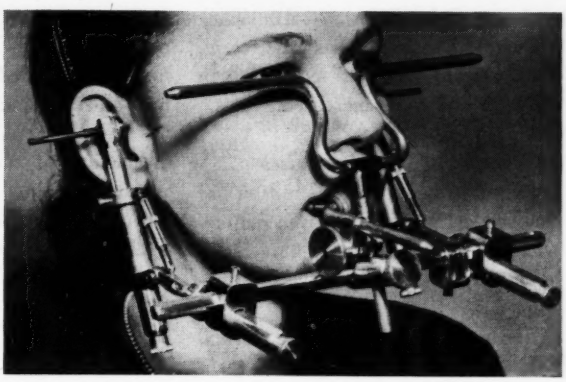
"Centric or physiologic rest position (13), centric relation, true centric position (14), eccentric jaw relationship (15), excentric intercuspation (16), functional centric position (17), functional centric relation (18), normal centric relation (19), rest or centric relation, true relaxed centric relation (20), true centric position (21), true mandibular centric position (22), true (relaxed) centric occlusion (23), true rest centric position, working or rest centric position (24)."

Duplication of Term—The same authority states that "A mandibular position corresponding to the arrow point, a position anterior of this and even the rest position have all been given the same term 'centric relation.'

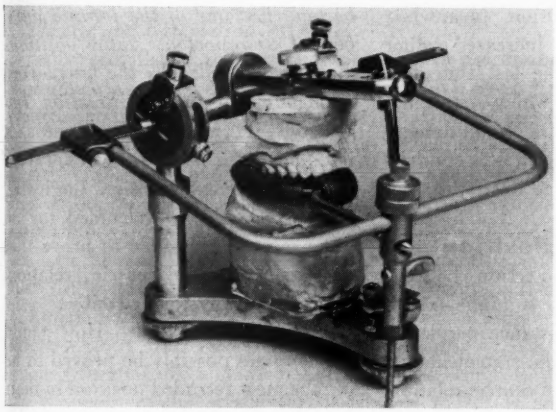
"1. Phillips (1927), Gysi (1929). 2. Stuart (1939). 3. Hanau (1925), National Society of Dental Prosthetics (1930), Simpson (1939). 4. Wild (1946). 5. Brenner (1943). 6. Gysi (1929). 7. Hight (1934). 8. Sears (1926). 9. Eltner (1912). 10. Koehler (1921). 11. Sears (1930), Hight (1930), McLean (1939), Granger (1945). 12. Hanau (1926). 13. E. Harris (1948). 14. Denen (1938). 15. McLean (1940). 16. McLean (1944). 17. Kurth (1938). 18. Hall

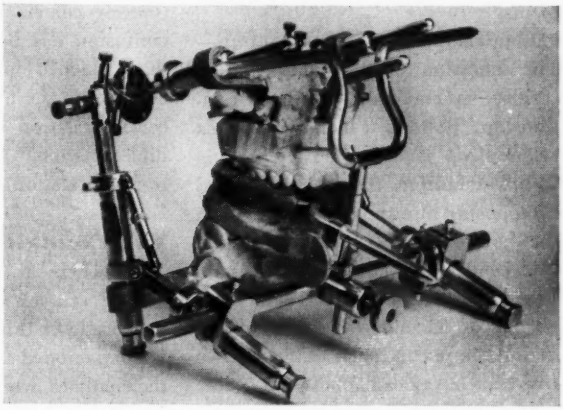
[1]Posselt, Ulf: Studies in the Mobility of the Human Mandible, Acta Odontologica Scandinavica **10**:23-24 (Supplement 10) 1952.





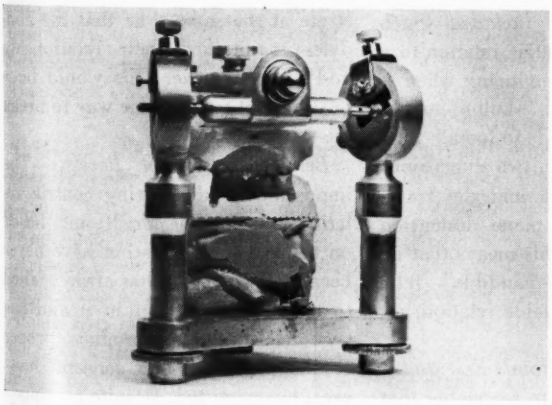
1A. *Centric relation and face-bow bite registration.*
1B. *Cranial relation and hinge-axes bite registration. Same bite used for both registrations. Dot on anterior rim of ear locates model's true right hinge-axis. Cross locates arbitrary hinge-axis (13 millimeters anterior to tragus on line to corner of eye).*

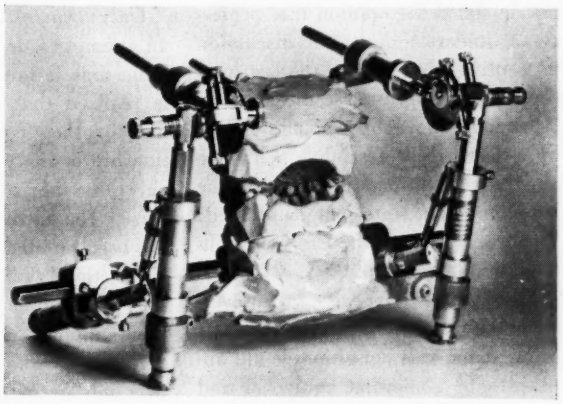




2A. *Centric relation and face-bow mounting.*

2B. *Cranial relation and hinge-axes mounting. Same registration bite used for both mountings*





3A. *Articulator occlusion resulting from centric relation and face-bow transfer and mounting. Does not duplicate mouth occlusion. Unsafe for diagnosis or articulation.*

3B. *Transographic occlusion resulting from cranial relation and hinge-axes transfer and mounting. Duplicates mouth occlusion. Safe for diagnosis or articulation.*

(1929). Brenner (1943). 19. Boos (1949). 21. Gillis (1941). 22. (1932). 24. Central Nebraska Study (1943). 20. Thompson et Craddock Thompson (1949). 23. Lindblom Club (1943)."

Arrow Point Relation—And since Posselt, himself, injects the term, "arrow point relation," confusion in the terminology is increased.

Variety of Definitions

Dentistry's formal definition of centric relation does not even remotely agree with the almost universally popular maxilla-to-mandible relationship.

Formal Definition—The formal definition is the following: "The mandible is in centric relation when the heads of the condyles are in their most retruded position from which the jaw can make free lateral movements."[2]

Condyle-to-Fossa Relationship—The definition quoted is far from describing a maxilla-to-mandible relationship. Rather, a condyle-to-fossa relationship is described. According to this definition, the general method of apposing bite-rims on the ridges in the horizontal plane cannot signify that centric relation has been established. Furthermore, whether it be in or out of harmony with the official definition, it can mean only that two bite-rims have been apposed in space; a concept that is utterly worthless in any kinematic problem such as articulation.

Attempt at Clarification—A recent article stated the opinion that professional understanding and discussion on centric relation over the last hundred years impressed the author as "smacking more of witchcraft than of a learned profession." With the apparent intention of clarifying the situation, the statement continued: "Centric relation is the terminal skull-to-mandible relation."

Statement Equivocal — However, since the mandible is an integral part of the skull, this definition would appear to be somewhat equivocal and little more than a careless, somewhat lofty way of repeating the elementary maxilla-to-mandible-bite-blocks-in-the-horizontal-plane concept already mentioned. Such value as the statement may have is contained in the word, "terminal."

Three Dimensional Application Lacking—Unless "terminal" is defined and located in three unchanging and unchangeable dimensions, we are still being offered something "smacking of witchcraft." Unfortunately, "terminal" is never defined or located in three dimensions. Rather, a diversion is occasioned by the assertion that "Centric relation is concerned with the temporomandibular joint."

Contradictory Assertions—Again, no progress in clarification has been made except that the concept of opposed bite-blocks has been exchanged for that of dentistry's formal definition of centric relation. Meanwhile confusion has been increased rather than lessened for the last statement contradicts the first which stated that centric relation was a "skull-to-mandible relation." Now it is a condyle-to-fossa relation.

The Condylar Position

Elsewhere a connection between centric relation and a hinge-axis is proposed. In this instance perplexity is compounded by the statement that the condyles, when in centric relation, are "in the trough of the glenoid fossa." If freshman anatomy is correct, a condyle rests upon the anterior slope of the mandibular fossa.

Only Dimensions Included—Such an attempt to tie centric relation to a hinge-axis is not convincing when it is realized that the "skull-to-mandible" or the "condyle-to-fossa" relationship is offered in two dimensions only: the horizontal and the transverse. The median plane dimension has been omitted. This means that no kinematic "skull-to-mandible" relation or any other usable relation has been supplied.

Relatively Fixed Points Essential—It is only necessary to remember that the relationship of one body to another requires that three points not in the same straight line on the one shall be in fixed orientation to three similar points on the other. The bodies may be stationary or in motion but the points must stay fixed relatively.

Centric Relation Discarded—The reason for the omission of the third plane dimension in centric relation is an excellent one; namely, *it cannot be done.* It was partly because of this fact that long ago we discarded centric relation in favor of condylar hinge positions and hinge-axes. These can be located readily and utilized easily without the use of centric relation as a prerequisite or aid.

Centric Relation Controlled by Hinge Axes—In fact the case is quite the reverse for it would be necessary to locate the hinge-axes and complement them with a cranial plane before arriving at a usable centric relation. *The latter would then (and does) become just one of the infinite number of unimportant static positions that are controlled by the hinge-axes.*

Location of Centric Relation Impossible—To many it will come as a jolt that there is no way of locating or of using centric relation. Logically, this fact should be welcomed for no one has ever been able to prove that he has obtained centric relation. There is no way to verify it.

Proof not Available—How could the condyles possibly be proved to be in "the most retruded position in their fossae from which lateral movements can be made?" There would be only one sure way to establish such proof; namely, move the jaw and demonstrate at the same time that the condyles maintained their relationship and did not move. This would be a neat but not too popular way to break the patient's jaw.

Belief in Concept Persists—The impossibility of utilizing centric relation is not a disaster. Results based on the use of the relation have never been satisfactory; it has always failed to merit the trust put in it and has regularly failed to produce proper results. Belief in this concept, however, has persisted. Despite continued failure, the operator has reaffirmed his faith in this mythical relation, assuming that the failure was his fault. How many decades of disaster does it take to create suspicion of the cause of failure? *One of the valid reasons why an egg will not hatch is because it is rotten.*

Investigation Rewarding—Not all

[2]National Society of Denture Prosthetists: Report by JADA **17**:1122-1124, 1930.

dentistry, fortunately, is deluded concerning centric relation. Some operators have already investigated and found the reason for discarding the concept.

A Terse Refutation—One of the most pertinent refutations of centric relation can be credited to Frank Hayes of Garner, Iowa. Challenged by a professor of prosthodontics for his disavowal of centric relation, Doctor Hayes countered with two pithy questions: "Where does centric relation go when you part your jaws?" Given the correct answer that it disappears, he asked simply "Can you chew without parting your jaws?"

Three-Point Orientation—It is universally established that vertical dimension may not be changed once centric relation has been established. To change the vertical would be to destroy the three-point orientation that is the essence of any and all relationships. This would apply whether the relationship be "skull-to-mandible" or "condyle-to-fossa."

Function Occurs out of Centric Relation—Since the jaws must be opened in chewing and when setting up the teeth in the articulator, it is clearly *impossible* to maintain or work with a final static position such as centric relation. All function occurs with the jaws out of centric relation. *By the time centric relation has been regained, function is over.* This is but part of the dilemma.

Shift in Occlusal Surfaces Impossible

Since vertical dimension may not be changed after obtaining centric relation, it is obvious that the type of occlusal surfaces may not be changed either. This means that it is impossible to shift from simple surfaced bite-blocks to complicated surfaced natural or cusp teeth if centric relation is to be used. *To do so is to place obstacles inside the limits of the all- important vertical dimension,* obstacles that will collide before the jaws can reach the final vertical dimension that gives centric relation its only value.

Difficulties Encountered—Practical evidence in support of this truth is inherent in the following difficulties commonly encountered in attempting to use cusp teeth, (1) the incessant grinding and milling necessary to eliminate "cuspal interference," and (2) the popularity of flat or unnatural types of teeth.

Imitative Measures—Such methods and teeth are but expedients tending to imitate and, in the case of flat teeth, actually to reproduce the original simple surfaced bite-blocks with which the case was started. When centric relation is used nothing else can succeed except by accident. That such mutilated and unnatural tooth surfaces are destructive to ridge tissues needs no elaboration.

Method Comprising Trial and Error

There is one and only one way by which natural cusp teeth may be used in conjunction with the theory of centric relation; a method that is tedious and uncertain. This is the repeat recheck and remount method.

Repetition Necessary—By constantly rechecking with waxbites and remounting the models in the articulator as the case progresses, it is possible to renew an approximately correct relationship. The procedure must be repeated, however, every time an occlusal change is made; otherwise errors are multiplied and the accuracy of the set-up will be destroyed.

Method Results in Occlusion Only—The recheck and remount method is the hard way, the way of trial, error, and approximate correction; furthermore, this method does not result in articulation but in occlusion only.

Basis of Exact Procedure

A much simpler method and the only exact procedure is inherent in the hinge position and hinge-axis concept. When used in conjunction with a cranial plane, rechecks and remounts are unnecessary. For the enlightenment of operators who assume that they are already employing hinge-axes and cranial planes but who still find that rechecks and remounts are required, let it be said that *correct* hinge-axes or cranial planes were not present to begin with. If they had been, rechecks and remounts would be unnecessary. Changes in vertical dimension and occlusal surfaces could be made at will. Physiologically, of course, changes in vertical dimension are limited by the patient's tolerance, the range within which musculature and esthetics are not violated. Mechanically, there is no limit.

Functional Concept Applied

Instead of working with a vulnerable centric relation (an immobile position) the hinge position, hinge-axes, and cranial plane concept provides a *mobile* condition; namely, kinematic control centers of rotation. A hinge position is "That position of a condyle in its fossa that permits location of a hinge-axis."

Position Constant to Axal Center—In this concept the condyle may pivot through a range that completely disrupts centric relation yet continue to maintain itself in a position on the fossal slope that is constant to the axal center or hinge-axis around which that condyle rotates.

Radial Distance Maintained—This rotational center, meanwhile, holds its radial distance from the mandibular arc of closure and the craniomaxillary points of apposition during final closure. The degree of opening or the type of occlusals may, therefore, be changed as desired in the articulator with absolute certainty that the instrument interdentation will be duplicated by the patient when the case is inserted.

Conclusion

Centric relation has been regarded as the key to articulation for over a century. Despite the attention focused upon the concept, only frustration and confusion have resulted.

The hinge-axes and cranial plane concept is a new viewpoint and a logical concept and should replace centric relation. This concept is mathematically sound and biomechanically proved.

104 *Garfield Avenue.*

Simplified Technique for Removal of Impacted Lower Third Molar

MAJOR M. H. SHANER, USAF (DC), Manchester, N.H.

DIGEST

Methods utilizing automatic and hand mallets and chisels in the removal of impacted lower third molars often induce excess trauma and undesirable postoperative effects. The technique described herein employs regulation dental burs for sectioning the impacted tooth.

Armamentarium Required

The following instruments are needed to complete the technique:

Right angle burs, Number 702, 703, or 560

Straight handpiece burs, Number 702, 703, or 560

Root elevators: East-West type: (Seldin 1-L, Winter 122): (Seldin 1-R, Winter 123)

Straight elevator, East-West elevator.

Anesthesia

Mandibular block anesthesia

Long buccal infiltration

Lingual infiltration (This is important for hemostasis in the operative field.)

Procedure for Crown Section

1. Use right angle burs to section the crown of the impacted tooth. The cut should be as close as possible to the cemento-enamel junction. A common mistake occurs when the operator breaks into the pulp chamber and assumes that the crown is completely sectioned. Sectioning *must* be complete before the next step is taken (Fig. 2).

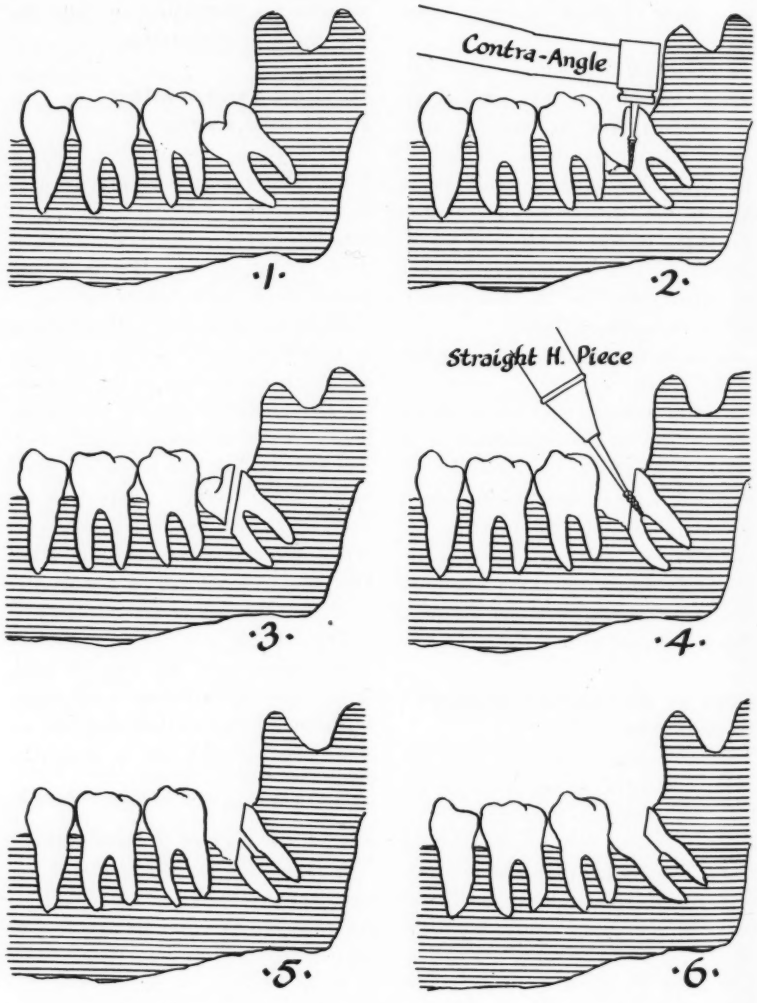
2. Use the straight elevator to remove the coronal section by placing it in the cut between crown and root. Rotate the fragment upward (Fig. 3).

Procedure for Root Section

1. Use the straight handpiece to make a cut between the roots for separation (Fig. 4).

2. Use the straight elevator between roots; a rotating motion will loosen one or both roots (Fig. 5).

3. Use East-West type elevators for removing the remaining root (Fig. 6).



1. *Schematic drawing of impaction.*
2. *Using the contra-angle in cutting through the crown.*
3. *The crown completely cut through.*
4. *The use of the straight handpiece to separate the roots.*
5. *Roots separated, ready for use of straight elevator.*
6. *One root remains, ready to use an East-West elevator.*

Conclusion

Sectioning of the tooth with the bur removes the impaction so that the remainder of the operation becomes the conventional molar extraction. The author has used this technique for a number of years and has found that it is not necessary to suture and that in most cases little postoperative treatment is required.

142 *Talbot Street.*

Hypotensive Anesthesia in Dentistry

J. C. MIDDLETON SHAW, D.Sc., M.A., B.Dent.Sc. (Dublin), D.D.S.(Rand), F.R.S. (S.A.), F.D.S.R.C.S.(Eng.), and A. E. Dodds, B. Sc., D.Ed. (S.A.), B.D.S. (Rand)

IN THE last several years a number of articles reporting hypotensive anesthesia have appeared. The drug used to lower the blood pressure in maxillofacial and oral surgery cases was Hexamethoniumbromide. Postural ischemia was maintained with the patient in a 10 to 15-degree Trendelenburg position. Special praise is offered for this technique in three types of operations.

Radical Antrum Operation

In this type of operation by the Caldwell-Luc approach theoretically the localization of foreign bodies in the maxillary is an easy matter, while in practice searching for a root in an antrum filled with polypi and gushing blood may prove to be a formidable task.

It has been found that with the patient in this hypotensive state and in a suitable position for the pooling of blood away from the site of operation, the antrum can be explored with ease and the necessity for aspiration from the operative area is minimal.

Reconstruction of Labial or Buccal Sulcus

Excessive bleeding in this operation not only prolongs the operation but often interferes with proper placing of the graft. With this technique it is reported that inserting the buccal or labial inlay is no more difficult than performing such an operation on a cadaver.

Extensive Mucoperiosteal Flaps

While not always profuse in these cases, bleeding is usually troublesome and postoperative ecchymosis is a constant feature. With this type of anesthesia operative time is greatly reduced and postoperative recovery almost free of undesirable symptoms.

Operation Devised

An operation demanding extensive reflection of mucoperiosteal flaps was devised to overcome one of the major difficulties in fitting dentures to mandibular ridges which present what has been termed "over-emphasized irregular mylohyoid ridges," which make the wearing of a lower denture difficult and painful. If the denture is to be prevented from impinging on the sharp ridge, retention must be sacrificed by eliminating lingual flanges.

Procedure—1. The lingual mucoperiosteum is reflected from the mandible, the posterior two-thirds of the mylohyoid muscle is detached, and the knife-edge mylohyoid ridge is removed to a point as far forward mesially as the cuspids.

2. Subsequently the lingual flanges of the lower denture may be extended deep into the lingual sulci without any discomfort to the patient or upward displacement of the denture during movement of the floor of the mouth.

Unwanted Sequelae Reduced—Under ordinary anesthesia the amount of swelling and ecchymosis in this case, if not controlled with ice-packs, can be frightening. If the hypotensive technique is used, unwanted sequelae are reduced to a minimum and healing is far more rapid.

Adapted from *Dental Magazine and Oral Topics* **69**:379-380 (October) 1953.

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ROTATED BICUSPIDS

and Axial Gradients

W. AMOS MOORE, D.D.S., Dayton, Ohio

DIGEST

Having recently encountered a number of upper bicuspids rotated through an arc of 180 degrees, this article is the result of the author's search for an explanation of widely rotated bicuspids and presents a persuasive argument in favor of the theory of axial gradients applied to this dental situation.

Contributing Factor in Minor Rotations

All dentists have seen numerous examples of rotated teeth and undoubtedly have often wondered as to the cause. Crowding from loss of deciduous teeth, macrodontia, and underdevelopment of supporting bone structures are no doubt contributing causes in cases of minor rotations.

Incidence of Major Rotation

In the case of bicuspids that are rotated through a 90-degree arc the factors mentioned must be ruled out as the greater diameter in these cases is in the mesial distal axis. Several times recently instances have been observed where the upper bicuspids have been rotated through an arc of 180 degrees. That is, the buccal cusp of the tooth is on the lingual and the lingual cusp is on the buccal.

Explanation for Phenomenon Sought

Speculation as to the logical explanation for the situation described suggests that the answer may possibly be found in the theory of axial gradients, a theory little known outside of the field of graduate biology.

Theory of Axial Gradients—The results of biologic experiments conducted lead to the belief that very early in the embryologic development of an animal a definitive tissue differentiation occurs. For example, if a few cells were removed from a beginning organism which has been predestined to form an arm or leg and if these cells could be cultured and permitted to develop, this tissue would develop into an arm or a leg as the case might be.

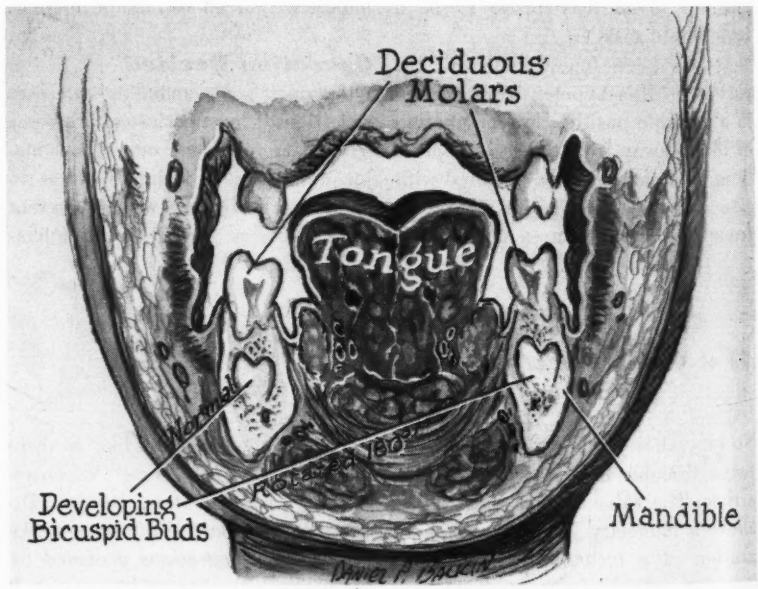
Lower Forms of Animal Life Used in Research—Most of the research that has been conducted has utilized the lower forms of animal life such as the Planaria. These studies tend to show that tissue differentiation may even be apparent as early as in the single cell stage where a fertilized ovum proceeds to divide and subdivide to form a new entity.

Polarity Determined by Metabolic Rate—In this situation the polarity of the cell is determined by the metabolic rate: the pole having the highest rate of metabolism develops into the head of the animal and the other pole into the tail, with the head end controlling the rest of the development.

Basic Theory

The gradation of tissue metabolism observed in study of the lower forms

(*Continued on page* 351)



A schematic drawing of a sectioned mandible through the first deciduous molar and bicuspid region. Note, on the left, that the bicuspid tooth bud is developing normally whereas that on the right is developing in a position rotated through 180 degrees from that of a normal bicuspid.

HERPES ZOSTER

MARTIN S. PROTZEL, D.D.S., Newark, N.J.

DIGEST

Herpes zoster, an inflammatory disease involving the posterior root ganglion, is accompanied by the distressing symptom of acute neuralgic pain. In the case history reported in this article a local anesthetic agent applied in the area of ganglion involvement proved almost immediately effective in reducing discomfort.

Description

Herpes zoster, commonly known as shingles, is an acute inflammatory disease of viral origin which involves the posterior root ganglion with symptoms exhibited in the segmental distribution areas involved. Occasionally, it may also follow noninflammatory lesions of the posterior roots such as trauma or tumors. The most frequent are those supplied by the intercostal, lumbar, and trigeminal nerves.

Symptoms—Symptoms of the disease are represented by (1) neuralgic pain, (2) rash in the area of sensory nerve innervation, (3) low-grade fever, and (4) malaise.

The Rash: Occurring in the segmental distribution of the nerve involved, the rash is in the form of grouped macules, papules, or papulovesicles appearing in band-like arrangement on an edematous hyperemic skin. The rash usually appears a few days after the prodromal signs of neuralgic pains.

Neuralgic Pain: The character of the pain is continuous, sharp, burning, and affects the areas innervated by the nerve root involved. A regional lymphadenopathy is present.

Complications—The symptoms described may be complicated by meningeal irritation, spread of infection from the posterior root ganglion to the anterior horn cells resulting in atrophy and weakness. Postherpetic neuralgia may persist for long periods of time. This condition is usually unilateral. An attack of herpes zoster is supposed to confer immunity. There are, however, instances of recurrence.

Pathologic Analysis—1. In acute hemorrhagic inflammatory infiltration in the posterior root ganglion with occasional involvement of the posterior gray horns of the cord, posterior roots, and the peripheral nerves is characteristic of this disease.

2. The inflammatory infiltration is in the form of mononuclear cells with polymorphonuclear leucocytes arranged in perivascular fashion.

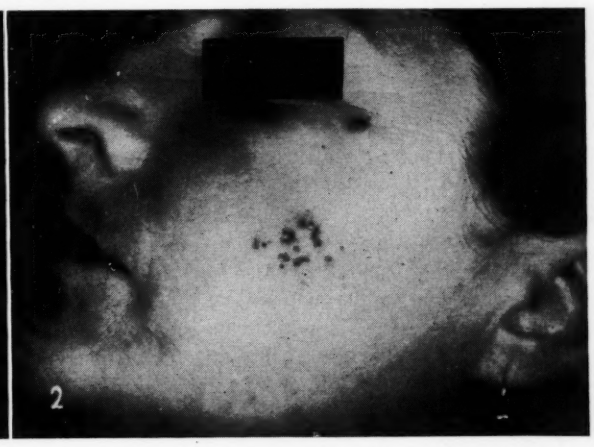
3. In severe cases there may be degenerate changes in the nerve cells along with secondary degeneration in the fibers.

4. Inflammatory changes are also present in the neighboring leptomeninges and the skin.

Case Report

The patient, a 42-year-old married

1. *Front view of patient revealing edema and rash.*



2. *Side view revealing rash.*

woman, referred to the author for diagnosis and treatment, presented the following symptoms:

1. For the past two days she had experienced extreme pain in all of the teeth of the left maxilla; the pain was also distributed to half of the head. The entire area of involvement was painful to touch.

2. In the left cheek area the patient experienced a sensation as if the skin would "break out."

3. On the third day the rash in the skin area of the cheek adjacent to the zygoma erupted into blisters filled with fluid. Concomitantly, at the mucous membrane of the oral mucosa in the mucobuccal fold adjacent to the molar teeth a painful lesion developed.

4. The face in the involved area became swollen and a zone of redness existed in the rash area (Fig. 1).

Patient Referred—Because the teeth in the involved area (left maxilla) were extremely painful, the patient sought the advice of her dentist who was unable to determine the cause of the condition and referred the patient to the author for diagnosis and treatment.

Examination—1. There was present a skin rash which consisted of a papulovesicular eruption on an edematous erythematous base (Fig. 2).

2. The vesicles were grouped together and arranged in band-like fashion (Fig. 3).

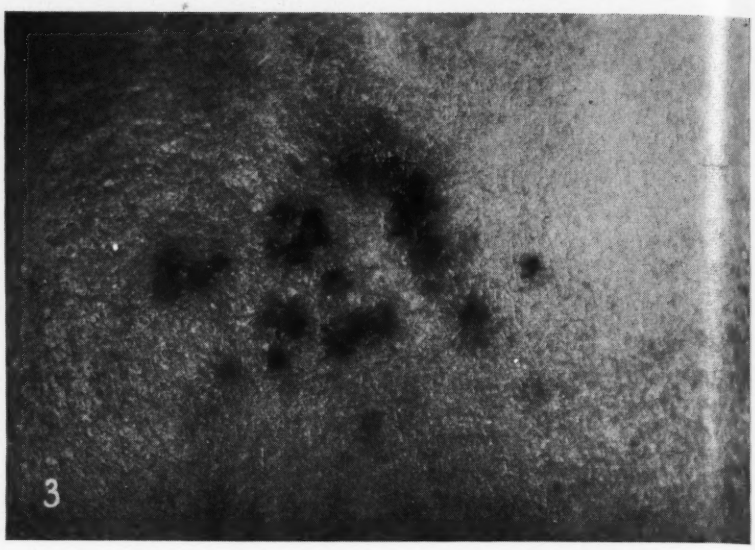
3. In the buccal mucosa adjacent to the left maxillary molars a yellowish gray ulcer on a reddened inflammatory base was observed (Fig. 4).

4. The left submaxillary lymph nodes were enlarged and tender.

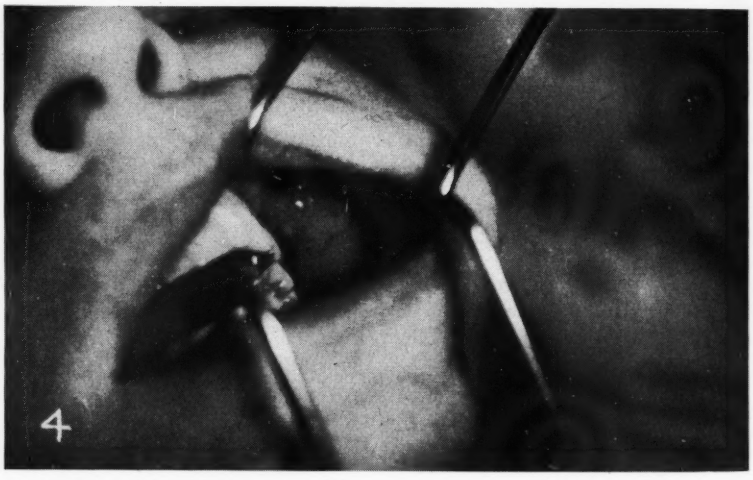
5. A slight elevation of temperature was present (99.6 degrees).

Roentgenographic Examination — The absence of any pathologic process in the teeth or osseous tissue in the involved areas was revealed by roentgenographic examination.

Diagnosis—On the basis of the subjective and objective symptoms the diagnosis of herpes zoster was made. This diagnosis was confirmed by the patient's physician.



3. ***Rash area, revealing vesicles arranged in band-like fashion.***



4. ***Lesion in oral mucosa.***

Treatment

1. Aureomycin, 250 milligram capsules, were prescribed, one every four hours.

2. A 3 per cent aureomycin crystalline ointment dressing was applied to the skin rash daily.

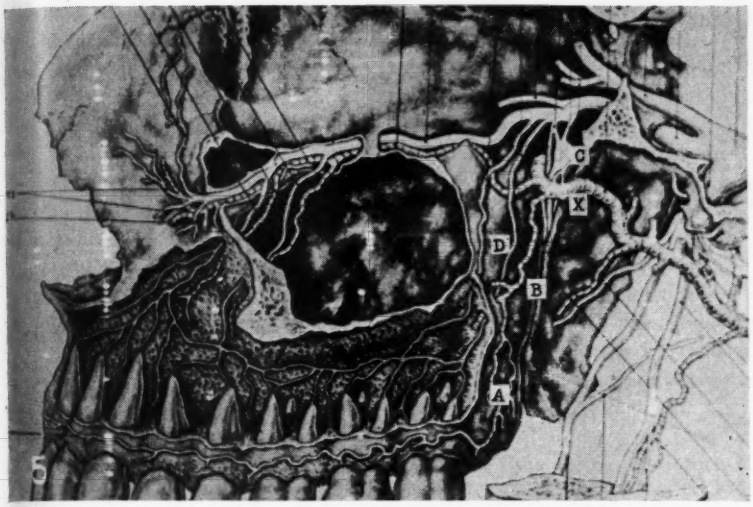
3. One cubic centimeter of Efocaine,® a prolonged acting, water miscible local anesthetic agent, was injected in the region of the left sphenopalatine ganglion.

4. The site of injection was at the tuberosity of the left maxilla; from this point the needle was passed adjacent to the pterygomaxillary fissure and then to the pterygopalatine fossa (Fig. 5).

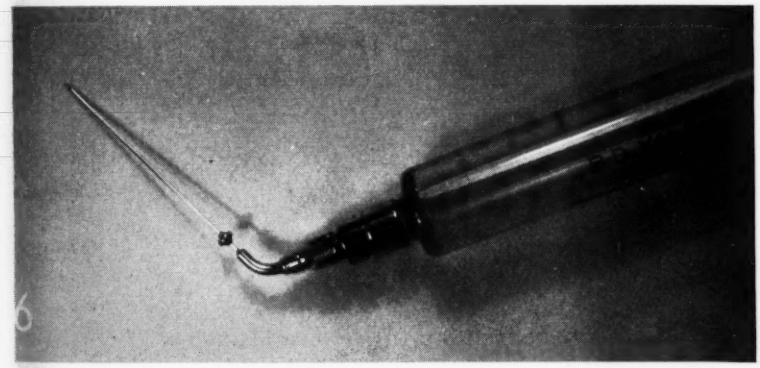
5. A Luer-Lok syringe with a two and one-half inch needle having a right angle hub was employed for the injection (Fig. 6).

Results From Therapy—A few minutes after the administration of Efocaine anesthetic signs of a typical sphenopalatine ganglionic block were experienced by the patient. At this time symptoms of the neuralgic pain had virtually disappeared. Some discomfort was felt, however, in the left orbital region, but the most distressing symptom was definitely alleviated. From this time the patient was comfortable and able to carry on her household duties without interruption.

Continued Improvement—Anesthe-



5. *Regional anatomy for ganglionic block. (A) tuberosity of maxilla; (B) pterygomaxillary fissure; (C) sphenopalatine ganglion in pterygopalatine fossa; (D) maxillary superior alveolar nerves; (X) internal maxillary artery.*



6. *Syringe and needle employed for injection.*

tic effects from the single injection of Efocaine persisted for ten days; during this time the rash, facial edema, and erythema disappeared. The lesion in the oral mucosa was coagulated with 8 per cent zinc chloride and covered with 3 per cent aureomycin crystalline ointment.

Present Condition—At the present time (two weeks after the initial visit) the patient is completely free of pain and all signs and symptoms of herpes zoster have disappeared.

Comment

A survey of the literature and clinical experience in cases of herpes zoster reveals that the neuralgic pain reported by the patient is the most distressing symptom in this condition. The injection of a prolonged acting, water miscible local anesthetic agent, Efocaine,® in the area of ganglion involvement may prove to be the agent for elimination of neuralgic pain associated with herpes zoster. The use of this agent in a large number of cases will be required to confirm its value.

1060 *Broad Street.*

Rotated Bicuspids and Axial Gradients

(*Continued from page* 348)

of animal life is demonstrable along the axis of the animal from its head to its caudal regions and the differentiation of the tissue is governed by its metabolism.

Application of Theory to Rotated Bicuspids

In the case of rotated bicuspids it may be possible that in the normal development of the tooth, that part of the invaginated or submerged epithelial tissue forming the tooth bud which is to become the buccal cusp has a slightly higher metabolism. It thus becomes the initiative and controlling factor in the tooth's development. Embryologic studies show that the buccal cusps are the first to calcify, and thus are the initiating force.

Imbalance in Metabolic Rate—If, through some accident of nature, the lingual part of the tooth bud tissue has the greatest metabolic rate, it will initiate and control the development of the tooth, resulting in a bicuspid rotated through 180 degrees.

Theoretic Submergence of Buccal Cusp—An accident of nature referred to could be the submergence of the buccal cusp deeper into the bone than the lingual cusp; because bone tissue has a scanty blood supply, the deepest tissue, therefore, having the smallest blood supply, would have the lowest metabolic rate.

Conclusion

The theory of axial gradients appears to be the most reasonable explanation for bicuspids rotated through a 180-degree arc and, with variation of the developmental accident, is also an explanation of various other degrees of rotation.

822 *Harries Building.*

EXCISION *of* RANULA

DANIEL J. HOLLAND, D.M.D.
Boston

DIGEST

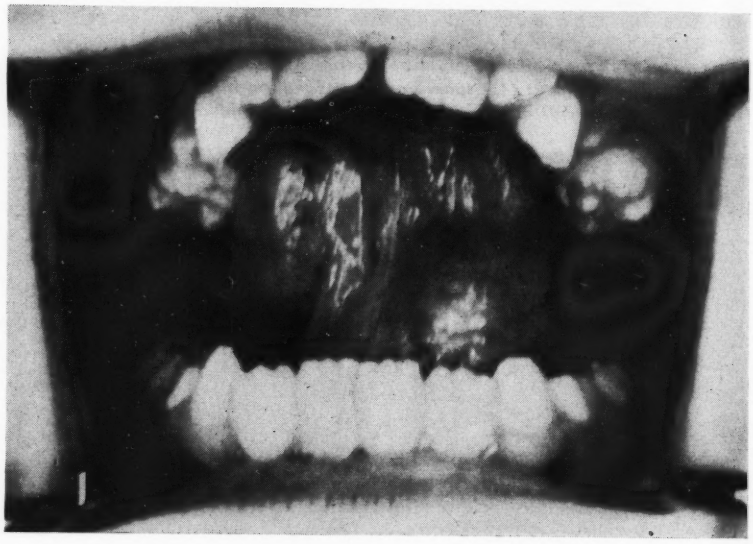
This article describes the surgical method used in the excision of a cystic tumor in the floor of the mouth which occurred in a six-year-old girl.

Occlusion of Excretory Ducts

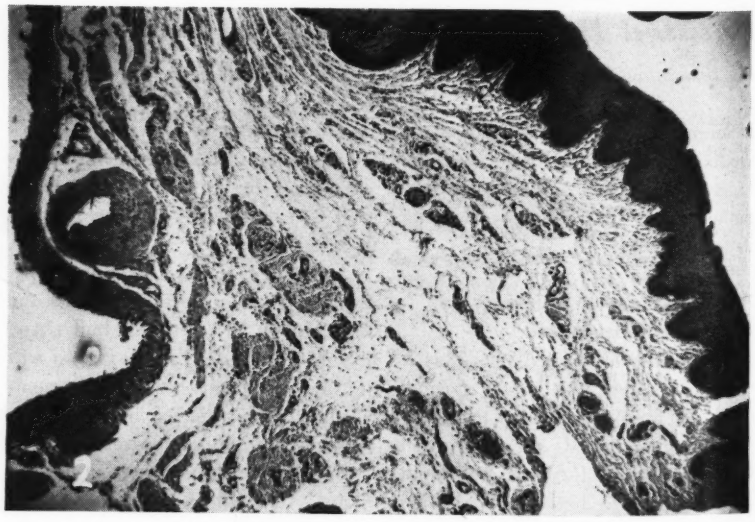
The sublingual gland is the smallest of the main salivary glands situated beneath the mucous membrane of the floor of the mouth at the side of the lingual frenum. Its excretory ducts are from eight to 20 in number, opening separately into the mouth in back of Wharton's duct and upon a fold of mucous membrane known as the plica sublingualis. When one or more of these excretory ducts become occluded, a cystic tumor in the floor of the mouth results.

Case History

A six-year-old girl was brought to the Massachusetts General Hospital Oral Surgical Clinic with a "blister-like swelling" under the left side of the tongue of two month's duration. The patient first called her mother's attention to the soft swelling two months previously; the mother's opinion was that it would subside spontaneously. Later the child was taken to a suburban hospital where the condition was unknown. It was suggested that she report to the Massachusetts General Hospital for diagnosis and treatment.



1. *Cystic swelling in left floor of mouth.*



2. *Note the epithelium lining the cyst on the left and the normal oral surface stratified squamous epithelium on the right.*

Physical Examination

The patient was a well-developed and well-nourished six-year-old girl in no distress. Examination disclosed the following conditions:

1. A bluish gray, soft, cystic swelling about 4 x 2 centimeters in the left floor of the mouth.

2. When the tongue was raised the mass bulged high over the occlusal levels of the lower teeth. The mass was soft and compressible to touch, nontender and noninflammatory (Fig. 1).

3. The six-year molars were erupted and there was moderate caries of the deciduous teeth. The remaining oral mucous membranes were normal.

4. Extraorally there was a diffuse noninflammatory, moderately tender swelling of the left sublingual space.

5. The left Wharton's duct was patent and the submaxillary triangle negative.

6. Temperature was normal. The results of other examinations were negative.

Diagnosis

A diagnosis of ranula was made. The patient was admitted to the hospital for excision.

Surgery

Under endotracheal nitrous oxide —oxygen, and ether anesthesia the following surgical steps were taken:

1. The patient was prepared and draped in the usual manner. Monocaine hydrochloride 1½ per cent with 1:100,000 epinephrine was infiltrated about the base of the cystic swelling for hemostasis.

2. A 4-centimeter incision, medial and parallel to Wharton's duct, was made in the extremely thin mucosal covering over the mass without perforating the cystic membrane from the overlying mucosa. The cyst was perforated and collapsed after emptying its mucous contents.

3. It was found that the ranula divided the mylohyoid muscle and extended down below the mylohyoid into the neck in hourglass fashion. By slow, blunt dissection, the entire cystic sac was enucleated in toto. The mucosa was approximated with catgut sutures.

Diagnosis Confirmed

The pathologic examination confirmed the diagnosis of ranula (Fig. 2). The patient was discharged on the fourth postoperative day.

Comment

Total excision of a large ranula which extended both above and below the mylohyoid muscle was the method of choice in a six-year-old girl rather than marsupialization.

1180 *Beacon Street.*

Gamma Globulin

THE AMOUNT of gamma globulin available for this season for the protection against or amelioration of the disease probably will not exceed 5 per cent of the amount desired. Great care and thoughtfulness on the part of the physician can reduce much of the unwarranted demand for this product, and make more effective that which is available.

Sufficient gamma globulin for the protection of the entire population cannot possibly be obtained. The total amount necessary, if indeed this procedure is desirable would require more than 150 million units of blood from which the final product is derived. The anticipated amount for this season will not exceed that which can be derived from five million units of blood.

It is clearly evident that the gamma globulin program for poliomyelitis is at best an inadequate method for either control or treatment. Few would contend that it affords promise in the long run. It is likely, however, that gamma globulin will continue to be of some value even after an effective vaccine becomes an established fact, since there will continue to be outbreaks of the disease among those who will not have been vaccinated.

In the midst of the current enthusiasm for this season's untried gamma globulin program, careful judgment must be exercised lest we deplete our reserves of two other plasma products whose usefulness is well established and important. The first of these is gamma globulin for measles. The second is liquid plasma, which, when stored at room temperature for six months, can be safely administered for the rapid correction of hypoproteinemia in the surgical patient unable to eat. There is no satisfactory or inexpensive substitute for either of these remedies.

From *The Proceedings of the Institute of Medicine of Chicago* **19**:314 (June 15) 1953.

GINGIVAL PITS

for Better Amalgams

MEYER M. SILVERMAN, D.D.S., Washington, D.C.

DIGEST

The author of this article has found that properly placed amalgam restorations are usually as efficient, and in some respects, more successful than the gold inlay. In the author's experience, the use of gingival amalgam pits without additional proximal retention has proved successful; after several years such amalgam restorations remain stable with intact margins. The step-by-step procedure for the completion of gingival pits as an aid in retention in various types of restorations is described.

Causes of Failures in Amalgam Restorations

Faulty preparations and improper handling of the amalgam will produce imperfect results. For this reason the amalgam is considered by some operators to be inferior to the gold inlay. Cavity preparation is extremely important in the placement of an excellent amalgam.

Proper Retention Important—Common failures of the Class II restorations are due to insufficient retention in the proximal area. If there is insufficient retention on the proximal, the amalgam will have a tendency to slide laterally resulting in a separation between the proximal margins of the amalgam and the tooth structure. Frequently the proximal will fracture away from the occlusal section with complete failure of the restoration.

Types of Retention—Various types of retention for the proximal area of an amalgam have been used to prolong the life of the restoration. Ingraham[1] and others recommend obtaining retention by using undercuts at the axiobuccal, axiolingual, and axiogingival line angles to retain the amalgam in the proximal area.

Gingival Amalgam Pits—The author has used gingival amalgam pits without additional proximal retention for several years. Clinically, Class II restorations have remained stable with margins as intact and tight as those found with the gold inlay.

Procedure in Placing the Gingival Pit

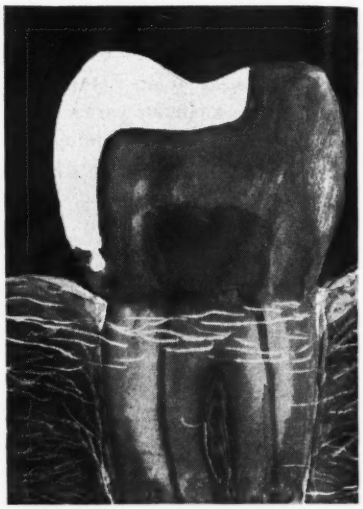
1. After the usual Class II preparation is made, the amalgam pit is placed on the gingival floor of the preparation, as shown in Figure 1.

2. The pit is placed with the smallest round bur (Number ½) in most cases. If there is sufficient provision for safety, the next larger bur (Number 1) is used.

3. Care must be taken to avoid the pulp. X-rays should be consulted to determine the size and position of the pulp. The size of the gingival floor will determine the size of the bur to use.

Position of the Pit—The pit is usually placed in the center of the gingival floor, equidistant from the margin to the axial wall and from the buccal to the lingual walls. In some situations it can only be placed closer to the buccal or the lingual areas of the gingival floor.

Depth of Pit—The pit is cut into the floor at least one half the diameter, and as much as the full diameter, of the round bur used. Not too much depth is required to prevent the lateral displacement of the amalgam. Just as one undercut will prevent the withdrawal of a wax pattern from its preparation, so will this one gingival pit prevent the lateral displacement of the proximal part of the amalgam restoration.



Use of More than One Pit—If the buccolingual width is sufficient, two pits are used to ensure additional resistance to lateral sliding. If a restoration is extensive, involving the buccal or lingual surfaces, the pits can be placed on the gingival floor around the buccal or lingual sections of the preparation.

Retention Provided in Extensive Restorations—Restorations with virtually one wall remaining have been restored, using the gingival pits described placed as frequently as possible. In these cases, after the pits are made with the round bur, the smallest size inverted cone bur (Number 33½)

(*Continued on page* 356)

[1]Ingraham, Rex: Application of Some Biochemical Principles in the Design of Inlay, Amalgam and Gold Foil Restorations, JADA **40**:402-413 ((April) 1950.

LIP HEMANGIOMA

Treated with Five Per Cent Sodium Morrhuate

JOSEPH C. TAM, D.D.S., M.S.D., Minneapolis

DIGEST

This case history describes the treatment applied successfully for obliteration of a slowly enlarging hemangioma on the inner surface of the upper lip which had been present in an elderly patient since childhood.

Case History

A healthy white woman, aged seventy, presented for general dental care. Her medical history indicated the presence of elevated blood pressure of five years' duration. No medication had been applied for the blood pressure.

Oral Examination

The following conditions were revealed in the oral examination:

1. The lips, tongue, throat, and buccal parietes were negative.

2. A small pyramidal shaped growth measuring about one-quarter of an inch in diameter was seen buccal of the upper right first and second bicuspid.

3. The lower centrals and lower right lateral were loose. The gingivae around these teeth were inflamed and hypertrophic.

4. A multitude of slightly elevated papillary shaped inflammatory growths covered the hard palate within the confines of the so-called palatal relief area.

5. The maxilla was edentulous and the mandible was partly edentulous except for the retention of the lower centrals and laterals.

Lesion on Inner Surface of Lip— On the inner surface of the upper right lip near the commissure an elevated lesion with a broad base about three-quarters of an inch in diameter with a dark purplish color and spongy consistency was present (Fig. 1). The lesion did not obliterate on pressure. Questioning revealed that the lesion had existed since childhood having slowly increased in size.

Tentative Diagnosis — The lesion was tentatively diagnosed as a simple hemangioma.

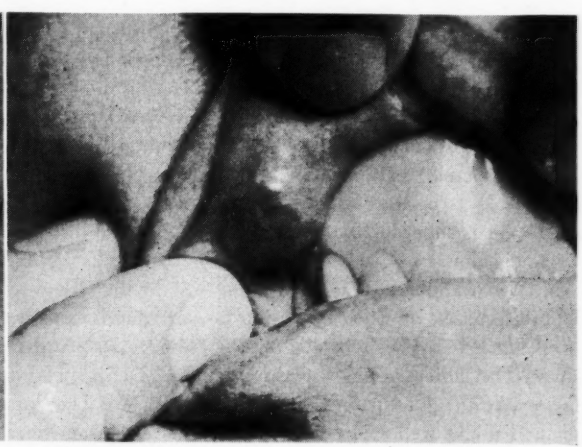
Radiographic Conclusions

X-ray examination revealed the maxilla to be negative and the lower centrals and laterals to have periodontal involvements and periapical radiolucencies.

Operation

A five-cubic-centimeter Luer-Lok syringe with a twenty-four-gauge needle containing one cubic centimeter of five per cent sodium morrhuate solution was used to treat the lesion. The needle was inserted into the middle of the lesion and blood aspirated into the syringe. The solution was then ejected slowly into the

1. *Elevated lesion about three-quarters of an inch in diameter, dark purple in color, and of a spongy consistency.*



2. *Thirty-five days after treatment with five per cent sodium morrhuate the hemangioma is greatly reduced in size and is barely evident.*

lesion. A gauze compress was held over the punctured area for half an hour to control the hemorrhage.

Postoperative Progress

1. Two days later the patient showed some discoloration of the right cheek and neck region. The lesion injected with sodium morrhuate was hard and deflated. There was no complaint of pain or discomfort.

2. Two weeks later some of the hardness had diminished, but the needle puncture was still evident.

3. Approximately a month after the initial operation the area of the lesion was still somewhat visible but normal in color (Fig. 2).

University of Minnesota.

Gingival Pits for Better Amalgams

(*Continued from page* 354)

is used to undercut all the pits to furnish the necessary retention. This procedure is in addition to the need for resistance against lateral displacement.

Summary

The pit placed on the gingival floor of the usual preparation is a simple and convenient method of resisting lateral displacement in Class II amalgam restorations.

In addition to the prevention of lateral displacement, retention can be obtained by undercutting these pits with the inverted cone bur.

Experience has shown the results to be extremely gratifying. Better and longer lasting amalgam restorations can be completed by adding this simple aid to the various steps required to produce an excellent restoration.

The Cavalier
3500 14*th Street, N.W.*

Ethyl Chloride Spray in the Treatment of Fibrositis, Myositis and Allied Conditions

M. M. KINAWI, M.Ch. (Cairo) F.R.C.S. (Eng.), Cairo, Egypt

THE USE of ethyl chloride spray as a freezing anesthetic is widely known, but its use in the treatment of acute and chronic rheumatic fibrositis and myositis, rheumatoid arthritis, and osteoarthritis, sprains, and certain fractures is not generally appreciated. From the accumulative experience with this agent in the last several years it would seem to have a definite value and merit frequent use.

Indications

From about a hundred cases in which the spray was used the following indications were revealed:

Acute Myositis—The spray is abortive in acute myositis of rheumatic origin, provided it is applied as early as possible after the onset of the attack. It is more effective when the lesion is superficial, and fibrositis responds almost to one single application. When applied after a day or so from the onset, or when the lesion is deep, it has to be repeated a few times. The indication for repetition is the sensation of returning pain. This method might well replace the use of salicylates and counterirritants, which, though effective, take a longer time to cause improvement.

Chronic Fibrositis—Ethyl chloride spray has proved successful when other methods fail to relieve chronic fibrositis. It definitely aborts "acute exacerbations" of the disease. To hasten its effect the sprays may accompany the usual general treatment. The use of ethyl chloride does not interfere with the use of short-wave therapy and both may be applied in deep lesions to obtain a more rapid result. When there are "trigger points," the injection of procaine into these points is preferred, but ethyl chloride spray may be used (1) if the injections are refused, or (2) if the condition of the skin (especially after the repeated application of local counterirritant ointments and plasters which the patient usually tries before referring to his physician) points to the possibility of a septic infection.

Arthritis Deformans—It is emphasized that the method is not curative in acute exacerbations of arthritis deformans, and that it is used only as an adjunct to the more recognized methods. The spray is extremely effective in ameliorating the pain.

Sprains—Ethyl chloride spray is used in sprains without a definite "trigger point." The spray is also indicated if there are abrasions and a septic injection is feared. In the treatment of sprains, the spray has to be repeated a few times daily until the pain ceases to return. It must be applied when the patient is feeling that the pain is coming back; this may require more than one spray a day, especially during the first day. The patient enjoys painless full movements during the treatment.

Method of Application

Ethyl chloride spray must be applied carefully. Prolongation of the spray after the skin becomes white will result in burn of the skin. The spray must be stopped when the skin begins to show white color at the site of the spray. If the pain does not disappear from that point, the spray may be repeated after a few minutes.

Patient Cooperation—The spray is first applied at the site of maximum pain. The patient is then instructed to move the part and asked to point out the sites of residual pain. The process is repeated until the part is free from pain. The patient is instructed that the area is to be sprayed as soon as the pain is felt to be coming back.

(*Continued on page* 376)

The EDITOR'S *Page*

A SUBJECT that is not discussed enough in dental circles is that of the problem patient. One might believe, from reading the dental literature and from listening to clinicians, that every case undertaken was an unqualified success. Such is not true. Even the most skillful clinicians have their share of difficulties and their moments of frustration.

Manly and Vinton[1] have undertaken an analysis of problem patients of the prosthodontist. These authors have divided full denture patients into three groups: (1) Those who have no difficulty in making the transition to an artificial denture. (2) Those who have temporary difficulty which responds favorably to treatment. (3) Those who have made a satisfactory adjustment to dentures. Every clinician will recognize each of these three types.

In this study, 100 denture wearers were evaluated to determine their ability to masticate food. Chewing ability with peanuts and coconut as test food was the criterion of a successful denture. Each patient chewed a weighted amount of food for a definite time and the chewed particles were then sifted through a 10-mesh screen. As a standard of measurement it was determined that in the case of a person with a *natural* dentition 78 per cent of the food particles would pass through the screen. This degree of pulverization was used as the index of a 100 per cent efficiency. "The average efficiency for 100 dentures was just 23 per cent. Thus, it would take the average denture wearer four times as long as normal to eat his food if he insisted on obtaining the same degree of pulverization."

The authors found that actually the denture wearer makes another kind of compensation. Rather than increasing his chewing time to secure a degree of pulverization comparable to the natural dentition, he swallows larger food particles. It is not stated what the physiologic implications of this practice might be.

Once again it is shown that statistical averages do not tell the entire human interest story. At the favorable extreme were seven patients who could masticate as well as the persons with natural dentitions. At the unfavorable extreme were persons who had only five per cent chewing efficiency. A breakdown by groups gave these figures:

"The best third of the denture cases had an efficiency of 53, the middle third had an efficiency of 23, and the poorer third had an efficiency of merely 11 per cent. Thus we can conclude that the difficulties experienced by the problem patient are real and not imaginary."

The transition from the natural dentition where the supporting arm of the tooth is embedded in bone to full dentures where there is no supporting structure reduces the power of the biting forces. "The average denture wearer can exert only one-fourth as much force in the molar region as that which could be exerted by the natural dentition." The authors conclude: "There is a real difference among denture patients in the forces which they can exert, but this difference does not appear to be responsible for superior or inferior masticatory ability."

In summary, Manly and Vinton state:

"1. There was a wide overlap in values of performance with superior and poor dentures. The superior dentures ranged from 16 to 83 per cent in efficiency and the poor dentures from 7 to 97 per cent.

"2. Young people tend to have a better chewing performance than older persons.

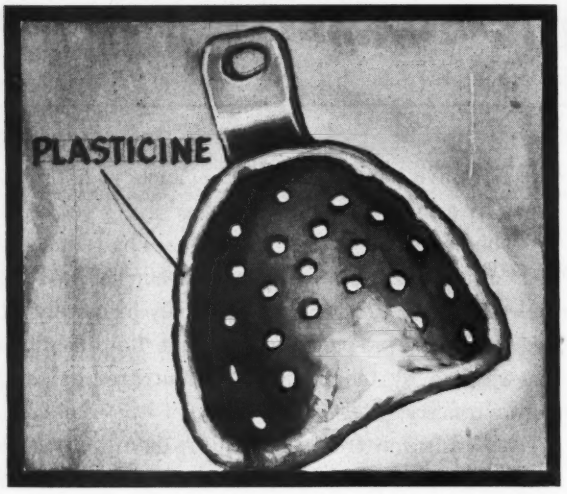
"3. There was no indication that the sex of the patient was a factor.

"4. The age of the denture in use did not seem to be important.

"5. The influence of alveolar resorption was not great, for in 80 per cent of the cases patients had good or superior ridges. There was no proof statistically that fair or poor ridges actually gave poor performances.

"6. There was no probable difference between the performances of the 50 patients with dentures bearing nonanatomic porcelain in comparison with the 29 that had anatomic porcelain teeth. Apparently, the differences that may exist between the efficiency of the two types of denture teeth is not great enough to account for the distinction between poor and efficient denture wearers."

[1]Manly, R. S., and Vinton, Paul: The Prosthodontist's Problem Patients, New York State D. J. **18**:No. 3, 113-118 (March) 1952.



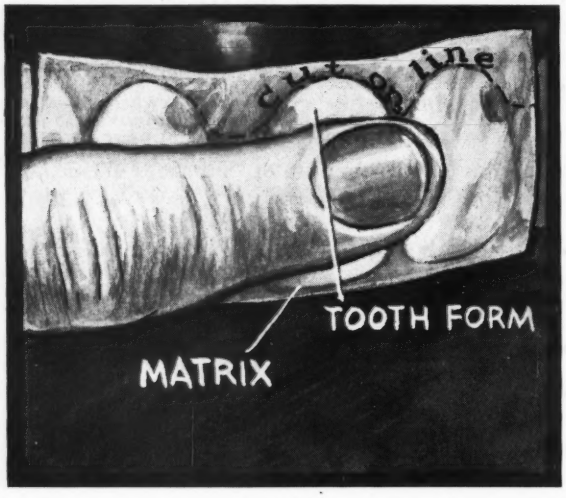
1

Clinical and Laborato

An Impression Aid

C. McDermott, D.D.S., Portage, Manitoba, Canada

1. To create an individual impression tray for use in full dentures, mold plasticine around the periphery of the metal tray and muscle trim. The plasticine covers the edges of the tray to prevent tissue injury. In cases of high vault the plasticine may be used to build up the palatal area before using the impression material of choice.

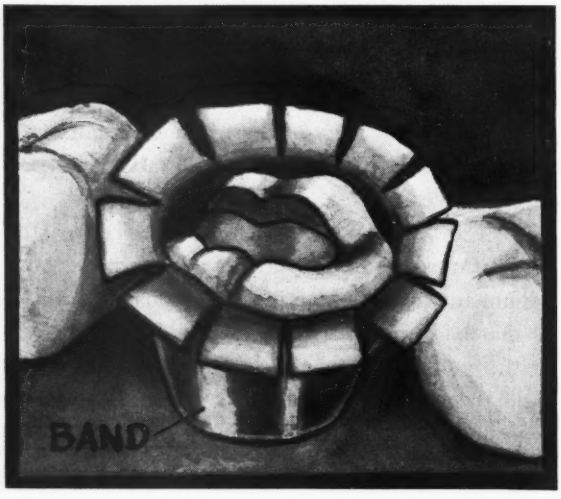


2

A Matrix for Gingival Cavities

L. S. Augustine, D.D.S., Tampa, Florida

2. Adapt a soft metal strip to cover the labial surfaces of the anterior teeth. Remove the strip and cut to tooth form. Prepare the cavity. Apply the plastic material, using a brush technique. Cover the restoration with the metal matrix and let set five minutes.



3

Copper Band Adaptation

Charles H. Hughes, D.D.S., Garden City, New York

3. A finger hold on a copper band may be secured by notching the band as illustrated. The advantages are: prevents cutting the operator's finger, aids in removal of the impression, allows a greater pressure to be applied.

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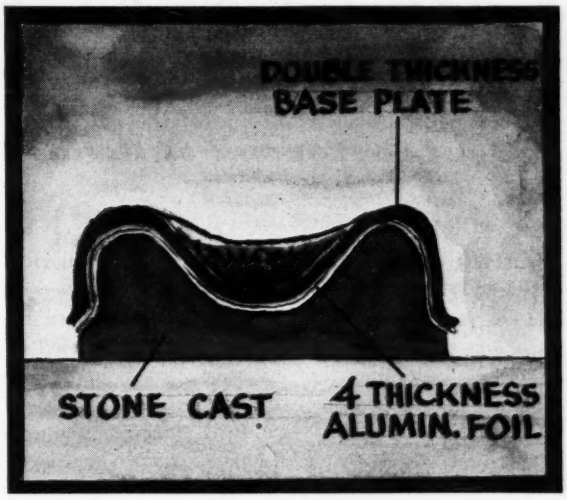
More Accurate Full Impressions

Louis McMaster, D.D.S., Pittsburgh

4. Adapt four thicknesses of aluminum foil over a cast made from a snap impression. Adapt and trim a double thickness of baseplate over the aluminum foil. Remove the foil and use a zinc oxide impression material as a wash. Even flow of impression material without pressure is assured by this technique.

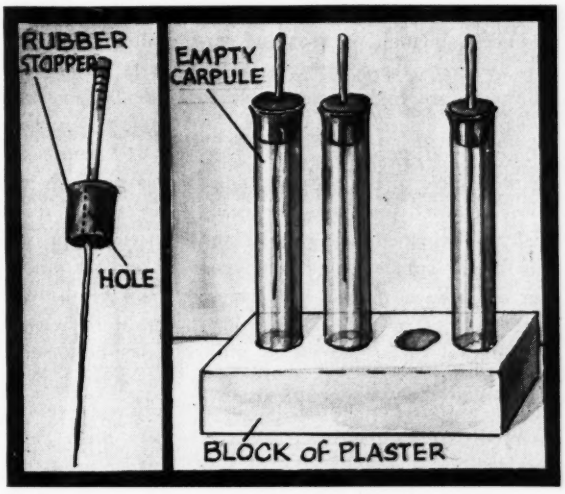


4

A Holder for Endodontic Instruments

Robert R. Goodhart, D.D.S., Philadelphia

5. Use empty anesthetic tubes. Punch a hole in the rubber stopper with a rubber dam punch. The rubber stopper acts as a seal in the glass tube to maintain sterility of the broach or reamer and also acts as a stop and marker after the length of the root canal has been measured.

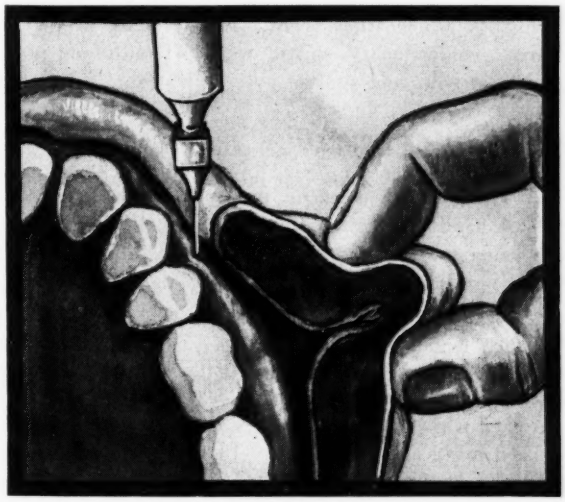


5

An Aid in Anesthesia

Gerald Jay Steinberg, D.D.S., Washington, D.C.

6. To facilitate the administration of local anesthesia on the buccal and labial surfaces, gently jerk the lip and cheek tissues up or down as the case may be before inserting the needle.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 366 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

Dental Caries in Rats Fed a Diet Containing Processed Cereal Foods and a Low Content of Refined Sugar

Identity with Human Caries Questioned

The coarse particle diets of some investigators and the refined diets of others containing an excessive amount of sugar produce carious lesions which occur almost exclusively on occlusal surfaces and originate, with few exceptions, only in the deep fissures.

One of the most disconcerting facts of such experimental caries is the general failure of caries to develop on buccal, lingual, or proximal surfaces, whereas these surfaces in human teeth are highly susceptible to caries.

Low-Fat, High-Sugar Diets—During the course of the present studies it was reported that diets consisting chiefly of skimmed milk powder and cane sugar supplemented with cod liver oil, induced buccal and lingual surface caries as well as proximal and occlusal surface caries in white rats.

Cervical Caries Noted—It has been observed also that the Syrian hamster may develop a cervical type of surface caries in addition to buccal caries (1) on a finely powdered diet consisting chiefly of powdered corn meal and whole milk powder, and (2) on a diet of whole wheat flour, cornstarch, confectionary sugar, whole powdered milk, and alfalfa.

Cariogenic Properties Studied

A study of the cariogenic properties of basal diet designated as 586 are being studied.

Basic Diet 586

Ingredients	*Percentage*
Cerelose (commercial glucose)	18.0
Enriched rye bread (dry)	25.0
Enriched white bread (dry)	25.0
Cooked rolled oats (dry)	15.0
Cooked yellow corn grits (dry)	15.0
Sodium chloride	2.0

Preparation of Diet—1. The rolled oats and corn grits were cooked about 1 hour, dried at 100 degrees Centigrade, and ground to a fine powder.

2. The bread was dried at 100 degrees Centigrade for a period of approximately eight hours to a golden-brown color and ground fine.

3. Vitamin B concentrates were added to provide thiamine 2.0 parts per million, riboflavin 3.0 parts per million, pyridoxine 2.5 parts per million, calcium pantothenate 20.0 parts per million, choline hydrochloride 1000 parts per million, and inositol 25.0 parts per million.

4. Vitamin A and D concentrate was given in separate feed cups (or directly by mouth) twice weekly to provide approximately 4,000 units of A and 800 units of D weekly.

Environmental Conditions—The rats were housed, usually in pairs in screen-bottomed cages and the diet was started at weaning. In other experiments rats were given the diet from birth and were on a sawdust surface prior to weaning. In this case the litters remained intact until the end of the experiment.

Animals of Holtzman Strain—All the rats were obtained from the stock colony at the National Institute of Health and were of the Holtzman strain. This colony is maintained on a stock diet consisting of Purina lab chow and greens, given twice weekly. Bread and milk are given daily during the first two weeks of life.

Method of Examination—The rats were sacrificed after about ninety days on the diet, the heads were autoclaved, and the flesh was removed. Prior to examining the teeth, the maxillae and mandibles (teeth *in situ*) were kept under water and in a refrigerator. The teeth were allowed to dry while being examined for caries under low power magnification. During this slow drying the initial white opaque areas, a characteristic effect of this diet, appeared easier to detect.

Results of Investigation

(1) Initially, the carious process appeared as an opaque elongated area in the enamel which progressed through various stages to an involvement of the dentin and loss of the entire tooth.

(2) The carious areas most frequently follow the gingival outline.

(3) Caries occurred mostly on buccal surfaces of lower molars, but was not limited to lower teeth or to buccal surfaces entirely.

(4) Lingual and mesial surfaces were sometimes involved.

(5) Occlusal caries was present, but unlike the occlusal caries previously referred to, did not appear to originate consistently deep in the sulci of the tooth.

Deficiency in Dietary Essential—It should be noted that Diet 586 does not involve a coarse particle factor and that the content of sugar (18 per cent) is relatively low. The obvious inadequacy of the cereal protein in the diet, particularly the lysine content, and the fact that the cereals have been heat processed, have suggested a somewhat new approach to problems of nutrition in relation to dental caries.

Effect of Processing on Nutritive Values of Food—Much information has accumulated concerning the effects of heat processing and storage on the nutritive properties, particularly the protein value, of foods. These effects are being investigated specifically in connection with the caries potential of Diet 586.

Conclusion

Under seemingly identical conditions groups of rats given Diet 586 may show a disconcerting variability in caries production. Over a period of two years, however, and in studies on approximately 500 rats, the above diet has continued to produce caries of the type described in relatively large numbers of animals.

Adapted from *Science* **116**:229-230 (Aug.) 1952.

MEDICINE and the Biologic Sciences

Restriction in Cardiac Cases

The diet and activities of many patients with heart disease are frequently limited too severely by the physician. The greatest amount of activity and pleasure consistent with the best interests of the patient should be allowed. Often the neurosis induced by unjustified limitations is more disabling than the original disorder.

Smoking in moderation may be permitted to the majority of patients with inactive forms of heart disease because of the satisfaction afforded. Tobacco smoke produces relatively little change in the cardiovascular system. However, smoking is forbidden in cases of active rheumatic carditis, acute myocardial infarction, or congestive heart failure since any increase in cardiac effort, though slight, is to be avoided. No patient with peripheral vascular disease should use tobacco.

The work of the heart is not greatly increased by climbing stairs. The cardiac patient who does not have congestive failure or anginal pain during exertion may be permitted to ascend stairs at a leisurely comfortable pace since the exertion is not much greater than that involved in descent or in walking an equivalent distance on the level ground. Deliberate retardation in walking, like hurrying, may augment cardiac effort.

For the vast majority of cardiac patients, air travel does not entail undue risks. Patients with coronary heart disease and anginal pain tolerate hypoxia without demonstrable harm or discomfort. Damaging strain in compensated cardiac patients does not occur during routine civilian air transport operations which do not exceed altitudes of 8,000 to 10,000 feet. Modern pressurized cabins rarely are subjected to more than 7,000 feet. The excitement incident to the trip and delays from mechanical factors or discomfort resulting from grounding because of weather conditions are factors of important consideration. Flying should be avoided in congestive failure or evidence of significantly diminished cardiac reserve, active rheumatic carditis, myocardial infarction during the preceding three months, or frequent anginal pain, especially if experienced at rest.

Most cardiac patients are able to work. The exceptions are those with active rheumatic carditis, chronic congestive heart failure, or intractable angina pectoris. The type and amount of work can be selected to avoid damage in most instances. A radical change in working habits should be recommended only after careful consideration of all factors involved.

Before drastically curtailing customary exercise the patient should be permitted to assess his capabilities and any deleterious effects of the exertion. Golf, shooting, fishing, riding, swimming, and even tennis often may be permitted.

Salt restriction in the treatment of cardiac decompensation is of unquestioned value but need not be extreme to produce the desired result. Rigid salt deprivation or strict adherence to the monotonous rice diet has not been proved materially to influence the course of hypertensive vascular disease. Whether the ultimate benefit accomplished is worth the sacrifice is questionable in many cases.

One should always remember that once the diagnosis of heart disease has been implanted in the mind, it is extremely difficult to uproot it, even though later proved false.

Levy, Robert L.: Needless Restriction in Cardiac Cases, Circulation **5**:454-461 (March) 1952.

Antiseptics in Surgery

In surgery the two major uses of antiseptics are (1) cleansing of body surfaces for the purposes of sharply reducing the bacterial population, and (2) destruction of bacteria for the purpose of sterilizing inanimate objects.

It is important in the surgery of trauma that the skin of the patient be cleansed by the best method possible. An antiseptic reasonably tolerated on single application to the patient's skin is usually unsuitable for repeated application to the surgeon's hands.

Iodine, 1 to 2 per cent in 70 per cent alcohol or in aqueous solution, is of value for preparation of the skin for needle puncture or as a single application before operation. Quarternary ammonium compound 0.1 per cent in alcohol is not as effective as a bactericide. It is satisfactory because of being better tolerated by intact skin. The several acridine compounds, such as Acrizane®, 1:200, and organic mercurial compounds used as tinctures, may also be employed.

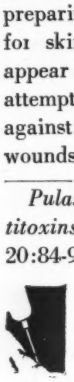
Cleansing the hands after contact with infectious material is best accomplished by scrubbing with warm water and soap for three minutes.

The idea persists in the minds of laymen and some physicians that the one essential in an abrasion or small simple lacerated wound is the killing of contaminated bacteria. Many antiseptic substances because of tradition and habit, are still used for this purpose. No antiseptic known today is equal in effectiveness to irrigation of the wound with sterile saline solution, gentle cleansing of the surrounding area with mild soap, and excision of devitalized tissue.

Nearly all antiseptics, such as tincture of iodine and many commercial agents, while bactericidal in vitro for many but not all microorganisms, are less effective in the wound environment because they are irreversibly bound to protein. Furthermore, these antiseptics are toxic to tissues and therefore tend to add to the necrotic material in a wound. Because of destructive action on leukocytes, they interfere with the local operation of natural defense mechanisms. The use of antiseptics in wounds has no merit. It may be hazardous and is therefore not recommended.

The local treatment of wound suppuration is never simply a problem of destroying the bacteria present. The bacteria reside not on the surface, but deep in the wound, where contact with topical agents is unlikely. With the possible exception of preparing clean granulating surfaces for skin grafting, antibiotics would appear to have eliminated the futile attempts to employ antiseptic agents against microorganisms in infected wounds.

Pulaski, Edwin J.: Antiseptics, Antitoxins and Antibiotics, Mod. Med. 20:84-90 (September 1) 1952.



Antibiotics for Prophylactic Use

Penicillin, aureomycin, and terramycin possess the widest range of antibacterial activity. They are therefore the most suitable for prophylactic treatment. Serious diseases such as rheumatic fever often can be prevented by simple prophylactic use of these preparations. The sulfonamide compounds still enjoy widespread use in the prevention of rheumatic fever because of the expense of antibiotics.

One other important use of these agents is the prevention of subacute bacterial endocarditis. Antibiotics should be employed prophylactically when patients who have cardiac murmurs undergo surgical procedures of certain types. The general term "cardiac murmurs" is used because it is often difficult or impossible to differentiate organic and functional murmurs.

The risk of subacute bacterial endocarditis is sufficient to justify use of prophylaxis unless the practitioner is certain that the murmur is functional. The operations that are most frequently followed by subacute bacterial endocarditis involve the mouth, throat, intestine, rectum, or prostate. Surgical procedures that directly involve the heart present another important indication for prophylaxis of this type.

In general, satisfactory prophylaxis usually can be accomplished by antibiotic therapy for one or two days before operation and for a few days during the postoperative period. Procaine penicillin is the perparation of choice because it is well suited for this purpose and is relatively inexpensive.

Wellman, William A.: Current Use of Antibiotics, Postgrad. Med. **12**:167-173 (*August*) 1952.

Radiation Necrosis of Jaw Bones

Radiation therapy for cancer in and about the oral cavity is frequently followed by irradiation osteonecrosis in the dental system. In one New York Hospital, 235 patients developed irradiation osteonecrosis among a total of 1,819 patients with intraoral cancer. In view of the increasing use of high voltage roentgen rays in treatment of oral cancer the effects on normal tissue have become increasingly important to the radiotherapist and to the oral surgeon.

If the patient is cured of cancer in or about the oral cavity by means of irradiation, postirradiation changes may occur years later within the jaw bones. Such a patient, who is usually seen by the oral surgeon, may have forgotten the primary lesion because he is now "cured." However, if teeth are removed from a region which previously had been irradiated enough to destroy the cancerous lesion, irradiation necrosis may follow the extraction. The prosthodontist may be involved if an appliance is inserted which exerts pressure on irradiated mucosa.

Teeth, regardless of the condition, should be removed before irradiation unless they are adequately protected. The alveolar process should be prepared and the mucosa sutured. The mucosa should be completely healed before the treatment is started.

The therapeutic approach to this problem varies from a recommendation to wait until sequestration to resection of the involved part.

Cook, T. J.: Late Radiation Necrosis of Jaw Bones, J. Oral Surg. **10**:118-141 (*April*) 1952.

BCG Vaccination

About 17,000,000 persons in the Scandinavian countries, in the war-devastated countries, and in undeveloped countries, outside Europe received BCG vaccine. The results suggest that adequately performed BCG vaccination produces specific immunity strong enough to provide protection to a great extent against severe tuberculosis, miliary tuberculosis, tuberculosis meningitis, and to a certain extent against pleurisy and post-primary tuberculosis.

The mortality and morbidity rates of tuberculosis have been reported to be lower in groups of adequately vaccinated persons than in nonvaccinated groups of tuberculin-negative persons. Many observers believe that BCG vaccination should be accepted as a public health measure against tuberculosis, particularly in these areas.

BCG vaccination in itself will not abolish tuberculosis in a community. Other measures are more important, such as those directed to the following results: (1) preventing tuberculosis infection, (2) increasing the natural resistance of the population by a high standard of living, (3) early detection of tuberculosis, and (4) giving every person in need of it adequate treatment.

The object of BCG vaccination is to produce artificial specific immunity in persons who are still uninfected. The earlier artificial immunity is established the better. In a country with a high incidence of tuberculosis, vaccination of children as young as pos-

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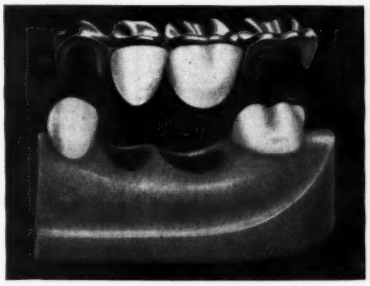

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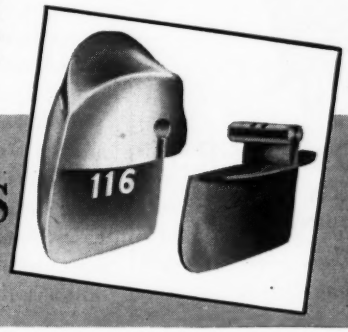

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measure. If most babies are born in maternity hospitals, the BCG vaccination is most conveniently performed on newborn infants, without any preliminary tuberculin testing. By tuberculin control and revaccination if necessary, the virulent infection, when and if it occurs, is generally prevented from producing clinical primary tuberculosis and early postprimary disease.

In persons of all age groups exposed to sources of infection, such as children in homes with tuberculous patients and hospital personnel, BCG vaccination should be performed as a public health measure in those still tuberculin-negative.

Wallgren, A.: BCG-Vaccination as Public Health Measure, Edinburgh Med. J. **59**:161-178 (April) 1952.

Backache

A statistical study of 2000 cases of backache at the Mayo Clinic indicated that approximately 26 per cent were the result of osteoarthritis. In approximately two-thirds of this 26 per cent, the osteoarthritis seemed to be the main factor underlying the backache. In the remaining one-third, other factors, such as root irritation, congenital anomalies, trauma, or disease of the urinary or genital system may have contributed to the backache.

In about 22 per cent of the cases a protrusion of an intervertebral disc was suspected. In the group of patients suspected of having protrusion of a disc only one-half gave a history of injury from lifting while approximately one-fourth attributed their injury to a fall.

The cause of the backache was indeterminate in 19 per cent of the cases. Some seemed to be related to fibrositis, others to postural strain. In some, the backache was of the type which is increased by activity and relieved by rest.

Any pain in the back that comes on in acute attacks should make one suspect an intraspinal cause and, most commonly, a protruded intervertebral

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Give to Conquer Cancer!

disc. The patient with a protruded disc is free from distress between attacks. Coughing, sneezing, blowing of the nose, and straining accentuate the pain.

Postural strain is precipitated by certain occupations. Surgeons and dentists seem to be especially liable. The backache produced by bending over work is sometimes relieved by using a support to elevate one foot. The elevation of one foot tends to straighten out the lumbar region of the spine and thus relieve the strain.

Before posture alone can be assumed to be the cause of backache, a complete study must be made. Patients with postural backaches may, however, be relieved by applying principles of body mechanics. The patient with weak muscles of the back and poor posture should sleep on a firm, straight, nonsagging mattress and preferably use only one light pillow beneath the head.

The use of belts, braces, corsets, and exercisers supplemented by mild exercises may be of aid in the treatment of the majority of cases of low back pain due to mild disorders of the lower dorsal and entire lumbar portions of the spinal column.

Editorial: Backache of Medical Practice, Postgrad. Med. **12**:98-99 (*July*) 1952.

Mirth Response Test

One of the tenets of Freud's theory is that humor is an important index to dynamic forces within the individual personality. Behavior related to humor is often disturbed in psychopathologic conditions.

When the subject has difficulty in expressing humor freely, it may be inferred that other more stressful emotions are even less easily expressed.

Different responses to humorous stimuli may be accounted for by the following assumptions: (1) When a stimulus elicits a humorous response, it is assumed that there has been a momentary release of some suppressed or repressed need, without the usual accompanying anxiety. (2) When a stimulus, ostensibly humorous, is responded to with indifference, it is assumed that (a) no "conflictual" needs are involved, (b) the needs are so deeply repressed that no participation is possible, or (c) rigid ego control is involved. (3) When an ostensibly humorous stimulus evokes anxiety, disgust, shame, guilt, or horror it is assumed that the release of some primary suppressed or repressed need produces a threat with the resulting affect or displeasure.

With these assumptions as a basis a test has been devised to ascertain the response to humor. It is tentatively named the Mirth Response Test (MRT). In this test a series of thirty-six popular cartoons are presented to a subject. Three successive procedures involve the observation and recording of these humorous stimuli. The three steps are (1) free expression, (2) sorting, and (3) inquiry.

Correlation of the test results with clinical findings tend to corroborate Freud's theory of humor and the three postulates derived from it. Analysis of the test findings leads to inferences about the subject's aggressive sexual

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CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 358 *and* 359)

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Subject: _____

Explanation of Procedure:

Sketch:

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and dependent needs, and the defenses mobilized against their expression.

Certain aspects of intellectual and emotional functions are also manifest in the test. The test is definitely of value in the diagnosis of many psychopathologic conditions.

Redlich, F. C.; Levine, J.; and Sohler, T. P.: Mirth Response Test: Preliminary Report of Psychodiagnostic Technique Utilizing Dynamics of Humor, Am. J. Orthopsychiat. **21**:717-735 (*October*) 1951.

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pH of Saliva and Tooth Decay

Query

Is there any treatment that will raise the pH of saliva in a person who is in excellent health and has no evidence of oral infection? A patient, aged 26, has saliva with a pH of 5 to 5.5, and he has persistent decalcification and decay of teeth.

Answer

The salivary pH in this case is unusually low and approaches the value to be expected in certain mouths after rinsing with sugar solutions. Since no data are given concerning the method of obtaining this pH reading or the conditions, such as time of day and relation to food intake, under which the measurement was made, it is suggested that a more complete study of the reaction of this patient's saliva might produce more reliable information.

Treatment Unknown—As far as is known, there is no treatment that will raise the pH of the saliva. The hydrogen ion concentration of the saliva has been stated to vary directly with the carbon dioxide content of the blood; i.e., when the carbon dioxide tension in the blood is high, more carbon dioxide finds its way into the salivary secretion to lower its pH, and vice versa.

Conditions Associated with Retention of Carbon Dioxide—Increased excretion of the gas in the saliva increases its acidity in the blood. Ingestion of sodium bicarbonate, while it

reduces the acidity of the urine, increases that of the saliva, since a rise in the carbon dioxide tension in the blood results. It would be well to study comprehensively the blood chemistry and dietary habits of this patient.

Relation to Dental Caries—Several investigators have been unable to show any relation between the reaction of saliva and the incidence of dental caries. The belief that an acid reaction of the saliva is harmful and that it is desirable to change it from acid to alkaline is probably without scientific basis.

Referral to Dentist Advised—It is suggested that this patient be referred to a competent dentist for treatment of the decalcification and decay of the teeth. These manifestations usually can be eliminated and their incidence reduced by proper restorative dentistry and, when indicated, by restriction of carbohydrates in the diet.

Protection Against Dental Lesions—The use of alkaligenic dentifrices is likely to be of little value in this case. But topical sodium fluoride applications, under the supervison of a dentist, may afford some protection against further occurrence of the dental lesions.

From Queries and Minor Notes, *Journal of the American Medical Association* **152**:483-484 (May 30), 1953.

Tonsillectomy and Poliomyelitis

TONSILLECTOMY does significantly increase the incidence of bulbar poliomyelitis when done during epidemics. The over-all incidence is probably increased but perhaps only by the increase of bulbar poliomyelitis. Elective tonsillectomies should be restricted in epidemic periods. Investigation should be made of a similar relationship of dental and oral and general operations to poliomyelitis and the need of restricting them in epidemic.

From *Journal of the American Medical Association* **151**:1182 (April 4) 1953.

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Contra-Angles

The Search for the Soul

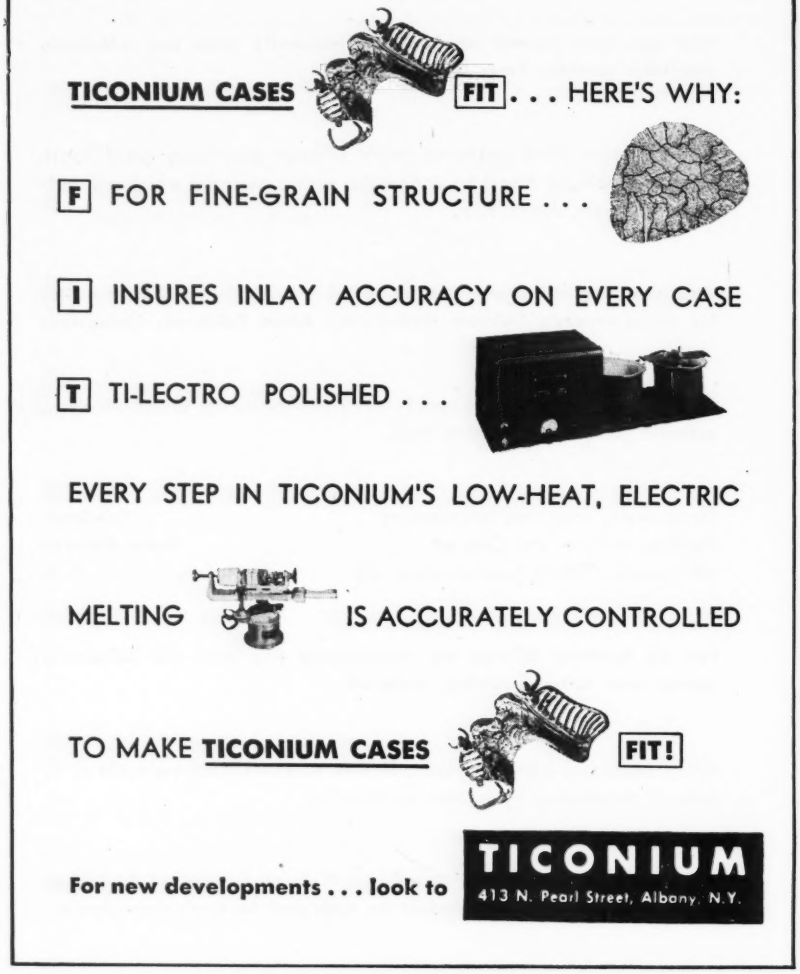
A distinguished professor of neurology was billed for a lecture before an important medical group under the title, "The Search for the Soul." My wife and I hurried into town to hear this inspiring-titled talk. Regrettably, only the title was elevating. The presentation was entirely mechanistic in philosophy and riddled with inconsistencies.

The gist of the talk was this: Theologians for the centuries have asserted that man had an immortal soul although they had never proved its location in human tissue. Searching scientists came along, European physicians for the most part, who tried to pin-point in the brain the exact area of the soul. Some of these scientists examined the protuberances and the depressions of the skull with the thought that the underlying contours of the brain influenced the shape of the cranium. They thought that the brain areas most highly developed would be larger, and that the larger and the more highly developed the area the more it would push outward upon the skull. Each area in the brain was supposed to have a specialized function and, by looking at and by feeling the contours of the skull, one could tell what was going on inside the cerebral hemispheres and which zones were well developed and which were poorly developed. From these excursions and from these observations phrenology was born which still has a vogue at county fairs and carnivals. But these searchers did not find the soul!

Somewhat later more enterprising investigators took a look at the brain itself. Not only did they look, but they mapped the territory and gave names and numbers to areas in the brain which they thought corresponded to certain bodily functions, affective states, mental powers, and sensory skills. They let their imaginations run wildly over the gray matter and made identifications that were impossible to prove. But they did not find the soul!

Still later other researchers with more refined methods and better material made serial sections of the brain to be studied under the microscope. In amazement they found that many of the widely proclaimed areas of specialized function did not exist in fact and that cellular differentiation within cerebral tissues was not as widespread as the imaginative map-drawers of the brain had thought. Actually, large areas of the frontal and occipital lobes of the brain may be removed without serious personality disorders. Removal of portions of the frontal lobes by lobotomy to correct nervous and mental diseases is an example. The important areas in the cerebral cortex appear to be in the parietal regions. But even these modern investigators

(*Continued on page* 370)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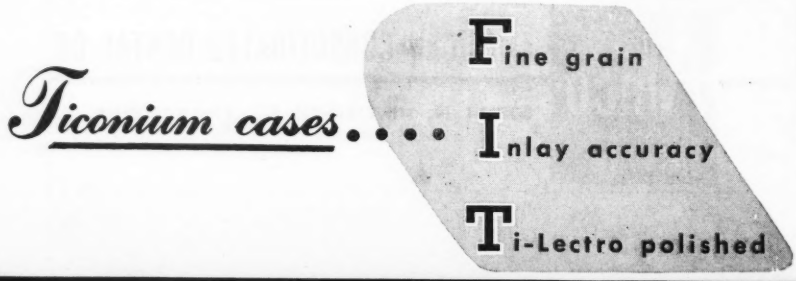

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in science did not find the soul!

After all these historical build-ups, sometimes tediously interlarded with lantern slides, the lecturer began searching for the soul. He didn't find it under a probe, by an electric current, or on a glass slide under a microscope. He said, rather disappointedly, that he had never even encountered a soul in surgical explorations inside the skull of living men. Nor for that matter, may I interject, had he ever seen or found a *mind*.

The professor spoke of electricity as something that exists and has function although unseen: "No one has ever seen an electric current." It was turgidly unclear whether this analogy meant that because no one has ever seen a soul, it did, or did not, exist. It is improbable that anyone will ever see a soul. There are things forever shielded from the eyes of men.

When any man passes outside the field of his competency to give opinions on subjects that are foreign to him, he endangers himself and his reputation. Nothing is more ridiculous than an educated man who mistakes his training in one field for oracular knowledge in every field. (We editors are guilty of this dereliction as much as any group.)

Actually, the lecturer did not say that there was not a soul. He did say that he was not able to locate such a *structure*. If one were uncritical he might fall into the error of accepting the professor's negative findings as evidence that there is no soul. Merely because one asserts that something does not exist is not proof of nonexistence. The fact that the soul cannot be discovered by the examination of physical tissue is not proof that it does not have being. Examinations of physical tissues by any method—by the use of the electron microscope, chemical or radioactive techniques, electronic devices—represent partial patterns of experience and not totality. To reason from a particular negative experience to make a statement of general principles is a perilous form of thinking.

I have no way of knowing what impact this talk, "The Search for the Soul," had on the audience. There was no question period, no discussion. The chairman made a quick ruling of adjournment. The audience was composed of men and women mature in years and experience. I would guess that those who had faith were undisturbed and those without faith were unimpressed. This kind of talk to a group of impressionable students might, on the other hand, be disastrous.

As one grows in years and experience he is disposed to lose any tendency to benumbed acceptance of the words of oracles. In youth, in the days of hero worship, the words of an oracle are more readily accepted. This talk, given before a group of young people could be a devastating experience. Youth, with high regard for the dogmas of science is endangered by what Drake calls "intellectual servility." On this subject, no less a scientific publication than the *Journal of the American Medical Association* (September 6, 1952) quotes Drake:

"An overweening regard for authority in the sciences, is the offspring, either of a slender under-

This is poor Henry Eyeball

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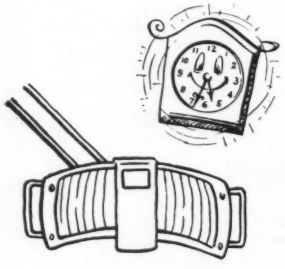

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standing or a timid spirit, still further enfeebled by bad education. It shows itself, not merely in an unsuspicious assent to alleged facts—a pardonable credulity—but in an implicit adoption of the conclusions of eminent men, when we should examine for ourselves, both their premises and reasonings. The latter species of intellectual servility, has done much harm to the profession, and through it to society at large. In general, we are under the necessity of receiving as true, that which the archives of medicine present to us as fact; for it is impossible to repeat every experiment, and many observations can never be made a second time, because the same combination of circumstances may not recur; but nothing should be taken on trust, when it can be avoided; as that which is reported correctly, may have been seen incorrectly, and the professions of truth with which a subject is introduced may be designed by the author, to protect it from suspicion. But the *reasonings* of an author, a professor or a colleague, are legitimate subjects of scrutiny, and he who passes timidly over them, admits an inferiority, which fearless investigation might convince him, did not exist. He becomes the slave of opinions, instead of the servant of truth; and contributes not more to the diffusion of falsehood, than to the degradation of his own character."

A neurologist has a clear right to express *informal* opinions on anything that fires his interest. When, however, he steps beyond the informal atmosphere of social conversation and appears as a principal speaker before an audience of serious-minded persons, he is no longer in informal surroundings but is expected to speak with the tongue of substantial fact. What one says around the fireside or on the golf course is "chatting." It is not intended to be considered too seriously. All of us say things in these circumstances that we would never utter from a rostrum or put in writing. Banalities or small chit-chat have a place in social conversation; it is not necessary to speak like a pundit or a philosopher among our friends. When we are speaking "seriously" (which does not mean in stuffy manner or ponderous tone) we are expected to speak from principles, to be logical, to present evidence, if it is a subject for which evidence is at hand.

The neurologist who spoke on the search for the soul was out of his depth. He should have read W. A. Sinclair, the philosopher from the University of Edinburgh, who states in his book "An Introduction to Philosophy," published by the Oxford University Press:

"There is not, and cannot be, any conflict between views on scientific matters and theological views, because they are views about different subjects. But there is a very real and profound conflict between the account of the universe and of man's place in it which is given by the theologians, and the account of the universe and of man's place in it which is given by most scientists. It is an observable fact that most scientists tend to a somewhat materialistic or at least non-theological view of man and the universe, but this view is not

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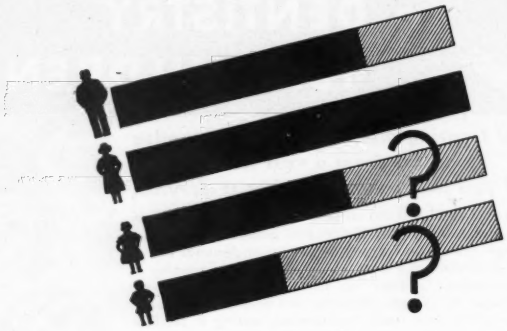

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★ ★ ★

Doctor Douglas W. Stephens is distressed by the type of humor on radio and television programs that can create dental panic in the minds of young or impressionable patients. To draw on outmoded dental procedures and exaggerate the element of pain in order to create a comedy situation is, in this writer's opinion, not only unfair to dentists and dentistry but to the public as well. Many people, none too eager to seek preventive care, may postpone or neglect dental treatment after listening to these travesties on dental experiences.

★ ★ ★

After twenty-five years of administering nitrous oxide-oxygen anesthesia, Doctor Joseph Dintenfass suggests that the dentist use all of the regular tests and precautions before administering the anesthetic—and then note carefully the time required to bring the patient past the second stage of anesthesia. Patients who pass through this stage rapidly should be brought back to consciousness immediately, for they are the ones who are prone to "retarded recovery," and who, in the author's opinion, account for the greatest proportion of fatalities under anesthesia.

★ ★ ★

Doctor Leo B. Dillon learned about patient psychology when he tactlessly answered a patient's query as to what he could do for her teeth, by bluntly stating, "Extract every one of them!" Out of this experience—which resulted in the temporary loss of a patient—grew a determination to find the most acceptable way to say, "Mrs. Patient, We Must Remove Your Teeth." He recounts his experience for the benefit of other practitioners.

★ ★ ★

In the May issue, an article, "Would You Be Happy Away From Dentistry?," caught the eye of Doctor Fred T. Joy. Having gotten away from dentistry—and being perfectly happy about the severance—he wrote a reply, "I Am Happy Away From Dentistry." So here's the other viewpoint for dentists who are considering retirement or a change in occupation.

★ ★ ★

Few people realize that dentists play an important role in the correction of speech defects. Doctor Howard E. Kessler, Dentofacial Speech Consultant for the Cleveland, Ohio School System, tells of his own clinical studies and urges other dentists to use their specialized knowledge of anatomy to aid children with speech defects. If you are a school dentist, this article should be doubly interesting to you.

itself a scientific view. It is one kind of metaphysical theory, which happens to be held for understandable reasons by most scientists, but it is not a scientific theory on that account, any more than it would be a financial theory if it were held by a stockbroker. The situation is that the theologian has worked out, or assumed, one answer to the problem of man and his nature, namely, a general philosophical view characterized by reference to a God or Gods as an explanation, while the scientist has worked out, or assumed, a different general philosophical view, usually characterized by material explanations only."

As a non-neurologist who is unsure of the details of neural anatomy, I sat through and came away frightened from the lecture. It was materialism and mechanism of a terrifying form. The man who gave the lecture apparently had ignored the teachings of the master neurologist, C. Judson Herrick, who wrote in the preface to his book, "George Ellett Coghill," which was published in 1949 by the University of Chicago Press:

"We have been taught for centuries that pure science is a system of facts and impersonal abstractions, devoid of human interest and without concern for values. It isn't and cannot be. The time has come to recognize the humanistic significance of science—so called pure science, I mean—and to adjust our practice accordingly."

And the student of Herrick, the great G. E. Coghill, who spent his life on studies of the nervous system, said in his "Anatomy and the Problem of Behaviour" (Cambridge University Press, 1929):

"Contrary to the dogma of certain behaviorists, man is more than the sum of his reflexes, instincts, and immediate reactions of all sorts. He is all these plus his creative potential for the future."

The neurologists, Herrick and Coghill, were successful in *their* search for the soul. It is "the potential for the future"—in this life and the life beyond.

—E.J.R.

★

A Comment from an Indianapolis Dentist

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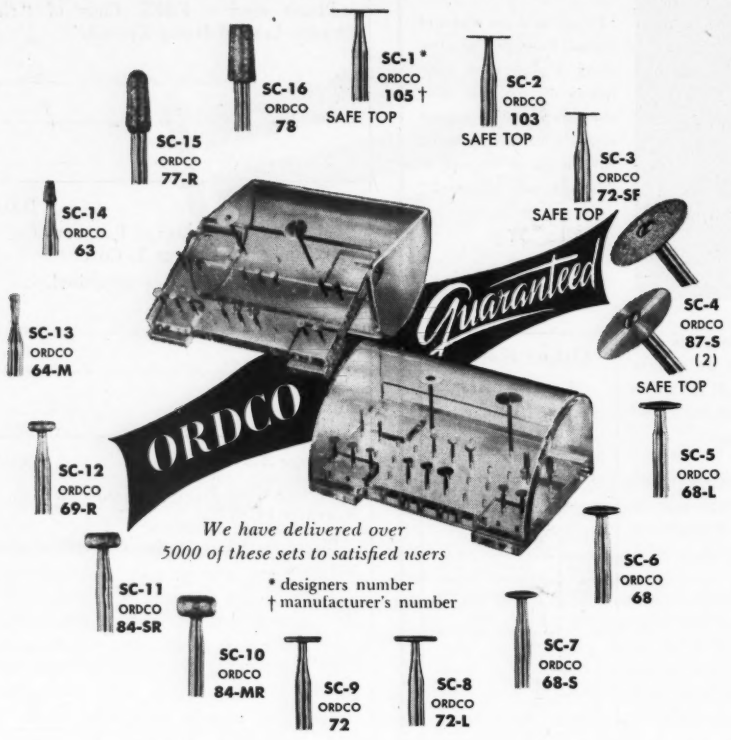

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Ordco offers this comprehensive cavity preparation set made to the exact millimetric dimensions (within .002") as prescribed and published by the designers.

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Ethyl Chloride Spray in the Treatment of Fibrositis, Myositis and Allied Conditions

(*Continued from page* 356)

This may never occur in acute rheumatic fibrositis treated early enough.

Approximate Period of Effectiveness—The interval of freedom will not be less than a few hours and will gradually lengthen until the pain does not return. For this reason the number and time of the applications are not limited or prearranged but depend entirely on the particular case. In the case of acute exacerbations of chronic conditions it was found that after disappearance of the pain, persistence in spraying the part at increasing intervals was useful in prolonging the freedom between the attacks and in lessening their recurrence.

Mode of Action

It was observed that after the spray the part became red. There seems no doubt that the beneficial effect of the spray follows the hyperemia which results from secondary vasodilatation after the freezing. This vasodilatation may persist for a few minutes, but sometimes it is observed after a few hours. The pain never returns when redness is still present. The cause of the vasodilatation is problematic and should be analyzed carefully by animal experimentation. It may be the result of local axon reflex or, less probably, through a central reflex. It remains to be ascertained whether "histamine-like" products are liberated or not.

Adapted from *Journal of the Royal Egyptian Medical Association* **35**:705-710 (Nos. 9, 10) 1952.

Advertising Index

American Consolidated Dental Co. 367
Ash, Sons & Co., Claudius 3rd Cover
Bosworth Co., Harry J. 364
Castle Co., Wilmot 370
Columbus Dental Mfg. Co. 369
Dental Perfection Co. 365
Dentists' Supply Co., The 4th Cover
Jefferson Hotel 364
Ney Co., The J. M. 340
O'Rourke Diamond Co. 376
Rocky Mountain Metal Prod. Co. 371
Schaffer Laboratories 338
Squibb & Sons, E. R., Div. of Mathieson Chemical Corp. 337
Ticonium 368
Universal Dental Co. ..... 2nd Cover
White Dental Mfg. Co., The S. S. 339
Williams Gold Refining Co. 373
Wilmot Castle Co. 370
Young Dental Mfg. Co. 364